Everything you need under one cover

ON SALE NOW!

internet

See page 120

Personal Computer World

Windows Accelerators
15 GRAPHICS CARDS

TOP 50 Utilities

Dashboard 95

RAI'S POWER Tools 3

QEMM 8

LAPLINK

Adaptec EZ-SCSI 4.0

NORTON

Fast workers
4 Pentium 166s

Super communicator

Nokia 9000
fax - web - phone and organiser in one

Battle of the browsers
Explorer 3 v Netscape 2

IF YOUR CD-ROM AND 3.5" DISK ARE MISSING ASK YOUR NEWSAGENT

VNU LABS
ALL HARDWARE TESTED BY THE VNU LABS

VNU LABS

DOUBLE DISK PACK
PRAIRIE DOG HUNT PRO
12 0f our top utilities

Contents

DOUBLE DISK SUPER PACK

Personal Computer World

On your CD-ROM and 3.5" Disk this month:

ON THE CD

12 Top Utilities
● Fake Cache Detect, HS-Install 2.0, Origami, Paintshop Pro 32-bit, Powertoy, Win Xpose I/O, WinZip 95, ZR Fileworks, Wincode, Drag'n'Zip, WebEdit 1.4c, Ameol

Demos
● Angoss Smartware Plus
● International Athletics
● Curator - electronic gallery
● Haunted House
● Toshenden - 3D beat 'em up

Shareware
● Cyril Cyberpunk - platform action
● War Craft II - role playing game
● Mastercode- memory game
● DS Tune - guitar utility

ON THE DISK
● Prairie Dog Hunt Pro
Great shooting game
● WinZone
● SmartBoard

Run A:\PCW.EXE from Windows

PCW Cover Disk

A super shoot 'em up, a cute clipboard enhancement and a useful utility.

PRAIRIE DOG HUNT PRO IS THE latest sequel to Prairie Dog Hunt for Windows. This new version has a 360° viewable area, frame-animated Prairie Dogs, a zoomable gun sight and improved sound effects. Due to the game's intensive animation, a powerful PC is recommended for best performance. If your video card doesn't support image stretching you will be told, and the Scope Zoom feature will be disabled. A Small Font video driver should be used in order for the game to start. Check your video card documentation for more information.

You can play Timed, or Open Season games. Timed games consist of shooting as many Dogs as possible in a set time.
• **Open Season:** Unlimited game play; load up 30 rounds in the clip and click on the Welcome Sign to begin or end an Open Season hunting session.
• **Game Options:** Click on Settings to open the interface. Select the style of game and the amount of ammunition in your clip, the density of Prairie Dogs, and their speed; drag the sliders to adjust the levels. The Skill Level Indicator will display the current difficulty level. Select either Open or Timed Session for the style of game you wish to play. Select up to 30 rounds of ammunition for your gun's clip.

To begin playing, click the Welcome Sign in the playing area. Clicking on it again will end a game.
• **Key Controls:**
```
1 Set Sight Zoom to 1.5x
2 Set Sight Zoom to 2x
3 Set Sight Zoom to 4x
R Reload / P Pause
Z Zoom Scope toggle.
```
● *Minimum requirements: 486 DX33 Processor, Windows 3.1, 4Mb RAM, 256 colour 640 x 480 VGA.*

SmartBoard
SmartBoard is known as a "Clipboard Stack". The normal Windows Clipboard is designed to keep track of a single piece of information ("clip-item") at a time, sometimes in multiple different formats but essentially the same basic data. If you copy a second piece of information to the Clipboard you lose what was there before.

SmartBoard enhances the capabilities of the Clipboard by enabling the collection of multiple items. It watches the Clipboard and automatically takes copies of any data which you have configured it to collect. By default, it only collects Text, Bitmaps and Metafiles if they are under a particular size, but you can reconfigure it to suit.

SmartBoard stores all the "clip-data" you collect across Windows sessions, too, so you can find and re-paste an item you copied yesterday, even if you've turned the PC off meanwhile. It can do a lot more, too. Full details are in the file SMARTBRD .HLP in the SMARTBRD sub-directory.
● *Minimum requirements: 386 Processor, Windows 3.1, 2Mb RAM, VGA graphics.*

WinZones
This is a feature-packed timezone utility for Windows. To start a new clock, click the Set button (S) on the clock, then click on "Start a New Clock". You can double-click the clock face to show or hide its menu and resize borders, or click the Set button (S) on the clock to access all options.

To change the city or timezone, click the Set button, then click the "Configure This Clock" button. Choose the city you want and, check Daylight Savings Time. To customise the clock's appearance, click the Set button, then "Configure this Clock". To set an alarm, click the Set button, then "Set Alarm".
● *Minimum requirements: 386 Processor, Windows 3.1, 2Mb RAM, VGA graphics.*

Robin Nixon

PLEASE READ THIS

If you have problems with the Cover Disk such as receiving a "Cannot read from drive A", error, please return the disk to the duplicator: TIB PLC (PCW), TIB House, 11 Edward Street, Bradford BD4 7BH (who may be contacted on 01274 736990) together with a stamped, addressed, envelope and two 25p stamps. Where it is a duplication fault, the postage will be returned along with a replacement disk.

If your problem is not due to a faulty disk, and a phone number is shown for the publisher of the program in question, then it will probably be quicker for you to call them first as they will be able to provide direct assistance on their own programs, faster than might otherwise be possible.

Alternatively, ring our floppy cover disk hotline on weekdays between 10.30am and 4.30pm on 0891 715929. Calls are charged at 39p per minute cheap rate and 49p at all other times.

The *PCW* cover disk is virus checked at every stage of production. However, *PCW* will not accept liability for any problems arising from the use of the disk. Installing or running any of the programs on the disk indicates your agreement to this condition.

You are advised not to install any software on a networked PC before checking the disk. While *PCW* maintains a high standard of quality control, disks may be damaged in transportation. Check the disk's shutter before inserting it in the drive by sliding it to the left and allowing it to spring back.
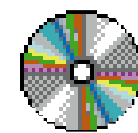
PCW Interactive CD-ROM

This month we've gone all out to bring you the very best in PC and Mac entertainment, information, applications, utilities, movies and more.

MAIN FEATURES
Global Internet
The complete access software for Global Internet. This Windows 3.1x and Win95 software includes Super Mosaic, a browser supporting HTML 3.0 and news-reading capabilities, and Eudora email. Included is everything you need to get on-line and receive 14 days unlimited access ABSOLUTELY FREE — just install the software using the button on the CD-ROM's front end, sign up to the service and your first 14 days of usage will be free.

Included with the access software is a seven-day trial of Cyber Patrol, a clever Internet helper application which you can configure to prevent your children gaining access to sites you feel

PCW INTERACTIVE: Entire Contents List

FEATURES
Tel-Me — On-line information service

DEMOS
Angoss Smartware Plus — Complete software suite
International Athletics — Multimedia demo
DIY PR — Public relations aid
Curator — Electronic gallery
Haunted House — For children
Toshinden — 3D beat 'em up
Cheltenham Computer Training — Learning guide
Winzones — Time and clock utility
Dragons — Childrens' interactive
Flying Fonts — Titling and animation
Top Gun — Flight simulator
Winnie the Witch — Childrens' demo

SHAREWARE FOR DOS
Cyril Cyberpunk — Platform arcade action
War Craft II — Role playing game
SHAREWARE FOR WINDOWS 3.1
Prairie Dog Hunt Pro — Shoot 'em up
Mastercode — Memory game

SHAREWARE FOR WINDOWS 95
DS Tune — Guitar tuning utility
Powertoys — Microsoft's Windows 95 goodies
Widen — Windows enhancement

MAGAZINE
PCW **Back Issues** — Database
Cakewalk, Fakenum, Meters, Plug260, VLT32, VPROG — Files from articles in this issue
Shareware — 12 programs from our magazine roundup

EXTRAS
Oakley Data Services — The complete shareware collection

REGULARS
Video for Windows — Version 1.1e (Win 3.x only)
CD Test — CD-ROM integrity checker
SVGA Drivers — Super VGA graphics drivers (Win 3.x only)

MACINTOSH
24 blistering shareware programs and demos

● **Minimum requirements:** 4Mb free RAM (some can be in a permanent swapfile), 386SX/33 processor, Windows 3.1. Users with less than this should be able to run all the DOS programs on the CD-ROM directly from DOS or Windows (rather than using the front-end). For best performance we recommend: 8Mb installed RAM, 486 DX/50 processor, Windows 3.11 or Windows 95.

would be unsuitable for them. Once set up, these sites are impossible to get to.

Cyber Patrol can also be installed using the second button on the PCWI front menu — if you already have an Internet connection and software to access it, you should back up any

relevant files. The software will install a Winsock.dll file which may conflict with others in the Windows/System directory. Call Global Internet Support on 0181 957 1010 if in doubt.

Global offers one of the best Internet services currently available. It is fast and

CONTINUES ON PAGE 147 ➡

Personal Computer World Internet

Global Internet - A superb Internet service and free software. If you already have an Internet connection you are advised not to install this software unless you are positive about how to set up...

14 days free on Global Internet. Dog hunting and code breaking

Personal Computer World Win 3.1

Prairie Dog Hunt Professional - Hunt those prairie dogs in the 3rd and best in the award winning Prairie Dog series from Diversions Software. 360 degrees of freedom, fully animated Prairie Dogs, zoomable weapon sight, authentic sound effects, high scores and multiple skill levels make for hours of mindless destruction !

Mastercode - The aim of this game is to find the code with as few guesses as possible, and in the quickest time to become the ultimate mastermind, in a code busting game of strategy and concentration. Have you got what it takes to crack the code? Why not find out?

reliable — in tests, we got through every time we tried. Downloading files from the US was as fast, or faster, than many other services.

Oakley Data Services

Oakley has built a solid reputation as one of the UK's top shareware publishers and its range of utilities is simply superb, adding all sorts of features to Windows — once you've got them, you wonder why Microsoft never put them there in the first place.

You're in for a real treat because this month's disc contains Microsoft's complete suite of over 30 programs, all of which are the very latest versions. Just click on the Oakley button on the CD-ROM front end to enter its browser with all the information you need about each program and quick install buttons. You can also run many of the programs directly off the CD-ROM.

Microsoft Powertoys

Don't miss out on the latest version of Microsoft's valuable additions to Windows 95. There's a whole range of utilities, but they're worth installing just for the QuickRes program that lets you change graphics mode without having to restart Windows (at last!).

Macintosh

To make up for the lack of Mac software on last month's CD (due to the inclusion

of Linux FT), we've put together a bumper 75Mb collection of 24 of the very best Mac programs currently available, including Aaron the Copeland look-a-like, Day of the Tentacle, Disinfectant, Graphic Convertor, RedShift 2, Super Grouch and many, many more.

Configuring video for Windows

If you select the "New users start here" button, on the first page of *PCW* Interactive, you'll have the opportunity to install the latest version of the Video for Windows runtime, so that you can view the

digital movies on the CD. If you haven't installed Video for Windows from a *PCW* Interactive CD before, then you should install this new version as it contains the latest drivers which deliver higher quality, a larger size and a faster playback rate. If you don't install the new version, some videos will display the message "Cannot display this video", or give similar warnings.

There are also some extra buttons on the Video for Windows page which allow you to fine-tune your PC's performance without having to leave *PCW* Interactive or restart Windows. In particular, you can choose to have digital movies played back on your PC at full screen resolution: without having to resort to hardware add-ons such as MPEG cards, you can have full screen digital videos when you run the *PCW* Interactive CD-ROM.

But please remember: when you exit from *PCW* Interactive, if you leave the option for full screen video selected, then all video in other applications will also be full screen. If you don't want this then re-run *PCW* interactive and select the "Windowed" option and quit again.

Testing your CD-ROM

If you suspect your CD-ROM may actually be faulty or damaged you can run the file CDTEST.EXE in the SYSTEM directory of the CD-ROM. The program will then examine every byte of data in the PC

Personal Computer World Demos

DIY PR - This relation duties templates for pre documents to en you have no ex...

Cheltenham Computer Training - Learn all about windows 3.1 and Windows 95 from these excellent training materials from a company that has helped train IBM, the Bank of England, Eagle Star and many more companies.

C.

WinZone - Keep with this time tracking multiple time zone c repetitive calculation

A dozen demon demos on our disc this month

Personal Computer World Demos

International Athletics
Enter the world of athletics with this informative multimedia title. Watch and hear historic events such as the olympic final mens 100m. Get on your starting blocks and get ready to race through miles of facts.

Curator Electronic Gallery Viewer
Create virtual gallery environments with ease. Just take a look at the pictures hanging up in this demo gallery to see just what can be achieved with this program.

Angoss Smartware Plus
Feast your eyes on this suite of software for Linux users. Included within this suite is a Word processor, Spreadsheet, Database and fourth generation programming language. All you need in one suite.

Right *Cut down your connection time with Tel-Me on-line technology.*

Below *A collection of 12 great shareware packages in the PCW magazine section.*

partition of the disc to see if it can be correctly read. The process takes up to 35 minutes and generates a verification code if the disc passes the test. If the CD-ROM fails this test, try cleaning it with a light solution of washing up liquid and dry it with a lint-free cloth and run the test again. If it continues to fail, return your CD-ROM to the magazine for a free replacement copy.

You are free to copy the CDTEST.EXE program to your hard disk in order to test other CD-ROMs as long as it is not distributed in any way. If you are running CDTEST from your hard drive you need to specify the CD-ROM drive to test, as follows:

```
CDTEST D:
```

Note: We offer this tool "As is" purely as an aid to diagnosing possible faults, some of which may occur because an older version of MSCDEX.EXE is in use and not because of a faulty CD-ROM, and we disclaim any responsibility for any erroneous error reports that it may generate.

IMPORTANT — READ THIS!
● General Protection Faults
If you receive General Protection Faults when running PCWI or playing any digital

videos it is probably because your graphic display driver may not be entirely Microsoft compatible. The answer is therefore to install one of Microsoft's own drivers as follows (but NOT if you are using Windows 95, as the drivers supplied with it are even newer than the ones on this disc):

1. Run "Windows Setup" from File Manager, then select "Options" followed by "Change System Settings".
2. Scroll through the list of displayed graphic drivers until you get to the final entry "Other Display (Requires Disk from OEM)" and select it.
3. Insert this month's CD-ROM into the drive and replace the "A:\" prompt with "D:\SYSTEM\SVGA256" (changing the D: to the correct letter if your CD-ROM is not in drive D:), then press Return.
4. Scroll through the new drivers until you find the ones beginning "Super VGA…" and select the one for the resolution you prefer to use. The driver will then be installed and Windows restarted. PCWI and Video for Windows should then have no further problems.

If this works (which it should in 95 percent of cases) you may wish to contact the supplier of your graphics card to see if they have an updated graphics driver. If Microsoft's drivers don't work you will need to contact your graphics card supplier anyway.

● If Video for Windows install fails
If the Video for Windows installation fails and you receive an error such as

"XXXXXXXX.YYY cannot be updated as it is a shared file", the answer is to delete the file "XXXXXXXX.YYY" (or whatever it is called) and reinstall Video for Windows.

● PCWI is slow to load, or runs slowly
You need at least 4Mb of RAM free to use PCWI. If necessary, you can obtain this by creating a permanent swap file of up to 4Mb. You are also advised to enable read cacheing of your CD-ROM by adding its name to the SMARTDRV line in your AUTOEXEC.BAT file.

You should also allow MSCDEX to set up its own buffers by adding a line such as /M:10 to the MSCDEX line, also in your AUTOEXEC.BAT file. Please refer to your manuals for full details.

● Windows NT and OS/2
Unfortunately, Macromedia Director, the program used to create PCWI, is incompatible with Windows NT. However, you should be able to run PCWI from OS/2 by simply calling up PCWI.EXE from the command line.

Robin Nixon

PCW *Advice & Contacts*

The PCW CD-ROM is virus checked at every stage of production. However, *PCW* will not accept liability for any problems arising from its use. You are advised not to install software on a networked PC before checking the disc.

For technical support on the CD-ROM and the programs on it call the VNU 24-hour Hotline on 0891 616 444. This is a computerised touch-tone advice system, providing hints and tips on a wide range of topics. It also offers you the opportunity to speak to a member of our technical support staff during office hours by pressing the 0 key on your keypad. Calls cost 39p min off-peak and 49p at all other times (tone phones only).

Using the computerised system you can access the information you need very quickly. If you request to speak to a member of our technical support staff and we cannot answer your question immediately, we will offer to call you back at our expense. Outside office hours you can leave us a message by pressing the 9 key. If you leave your phone number we'll call you back at the earliest opportunity during office hours.

If you prefer, you can email rnixon@cix.compulink.co.uk, or on CompuServe 70007,5547.

Personal Computer World

For Lotus, its Notes groupware package has very quickly become the tail that wags the dog. Lotus never expected its once flagship product, Lotus 1-2-3, to become just a small part of the second best-selling (by miles) office suite.

Almost unbelievably, only 25 developers worked on Release 3 of Notes. For Release 4, reviewed in last month's *PCW*, the number has grown to 100. It's still a tiny number considering that IBM's desktop software strategy (it acquired Lotus last year) and the whole future of Lotus depends on them.

The thing that's given Notes critical mass is Business partners. Just as Lotus Add-Ins boosted 1-2-3, the 10,000-plus Notes business partners have turbo-charged Notes. Although some people reckon that Intranets will give the Lotus product trouble, Notes has a significant edge in terms of security, robustness and commitment from corporate companies. And Lotus has been working hard to add Internet interoperability as quickly as it can. "We're aggressively focused on the Internet in everything we do," is the general Lotus line.

With its application component technology, due for release in the summer, Lotus also (for once) has an edge over arch rival Microsoft. The components will allow mini, cut-down spreadsheets, word processors and so on, fully compatible with the Office and Smartsuite file formats, to be embedded in Notes documents — or Microsoft Office documents come to that. Just the kind of object-orientated programming technology that Microsoft has promised for so long and not delivered. (See *News Analysis,* page 34.)

Notes has been a thorn in Microsoft's side for a while and it's getting bigger. Microsoft Exchange, Microsoft's latest stab at groupware, has much of Notes' messaging capability, but there's a whole lot of other stuff in the Lotus product that Microsoft is nowhere near.

**Ben Tisdall
Editor**

Next Month

Unavoidably detained last month, we reveal this year's winners of the most prestigious IT awards.

PCW AWARDS 1996

Personal Computer World

⭐ ## Monitors Group Test
PCW benchtests more than 20 of the latest 15in and 17in displays

⭐ ## RAMifications
PC memory types explained

⭐ ## Language Translation Software
Move your documents from one language to another

| **July 96 issue**
— **On sale Thursday 6th June** | **August 96 issue**
— **On sale Thursday 4th July**
● **Multimedia: Pentium 133** |

* Next month's contents subject to change.

PCW
Newsprint

Compaq 120Mb drive joins battle of the superfloppies

The battle of the superfloppies intensified last month with the advent of Compaq's 120Mb drive, as 1Gb-plus removables from Iomega and Syquest hit the market.

Compaq's selling point is that its drive, using 3M-made 120Mb disks costing about £12, can also read and write standard 1.44Mb floppies. It will appear on several Compaq models this year.

Compaq was forced into a premature announcement of its drive last year when Iomega launched its low-cost Zip drive which takes 100Mb cartridges. Demand for the Zip quickly outstripped supply, revealing a market hungry for a high-capacity successor to the 1.44Mb floppy. Iomega's arch-rival, Syquest, countered with the EZ-

135, which takes 135Mb cartridges.

Both drives are available in internal versions, so they can be fitted into PCs as auxiliaries to the floppy. The newer drives, both claiming fast seek times of 12 milliseconds, are:
● The Jaz, from Iomega. Lists at £399. Takes 3.5in 1Gb cartridges costing £89 each and has a claimed sustained transfer rate of up to 6.73 Mb/sec.
● The Syjet, from Syquest, costs £349 and takes £40 650Mb cartridges, or £60 1.3Gb cartridges, with a claimed transfer rate of 4Mb/sec. These prices should be taken with a pinch of salt as they are likely to be adjusted to compete. The Jaz drive has an edge in that it is available now.

Syquest European VP,

Bernhard Schuh, doubted whether the Compaq drive would hit the market before autumn but admitted that it would challenge the EZ-135, as well as the Zip. "But before it appears, we will have on the market a drive falling somewhere between the Ez-135 and the Syjet. We will beat it on capacity." He said Syquest's Winchester heads would always be faster than the Compaq. The rival drives may mean that no

superfloppy will achieve the wide acceptance of the 1.44Mb disk, so there will remain no standard medium for swapping big files.

Joe Dura, at Dataquest, believes this need for a data interchange medium will maintain sales of QIC and Travan tape cartridges. Tape offers the lowest cost per megabyte.

The CD-erasable is on the horizon, and the multi-gigabyte rewritable DVD disk could be with us by 1999.

Comdex Stop Press

Ten-speed CD
Pioneer was due to announce a ten-speed CD drive at the UK Comdex.

Visit *PCW*'s Web page at www.vnu.com/hc/pcw for this and other Comdex highlights.

At last... a return to the true portable

A new, slimline Thinkpad may signal a return to the truly portable notebook.

The size and design philosophy of the new 560 is similar to that of the early H-P OmniBooks: light (4.1lbs) and small enough to fit into a briefcase. But it comes with a choice of 12.1in active matrix or 11.3in dual-scan SVGA screens, and 100MHz or 120MHz Pentium processors.

A 13MHz model will be

available in July.

The floppy drive is detachable — IBM mobile products manager, Gary Milner, said the notebook floppy could be on its way out with the increasing use of network or wireless links to transfer information to a desktop.

IBM has also announced three new high-end Thinkpad 760s, with a 133MHz option and

a 365 X/XD desktop-standard business machine. All new models support the new 32-bit PC Card standard.

RAM prices level off after big fall

The price of RAM is expected to stabilise, having dropped by some 50 percent since the start of the year. Trade prices of a basic 4Mb 72-pin SIMM hovered at between £35 and £37 as we went to press.

This translates to a low of about £55 in the shops, although some dealers have been slow to pass price cuts to users.

Mark Leathem, of memory

maker Kingston, thought that the prices would rise by a couple of pounds and then level off.

He did not expect them to fall again drastically. "It would get so that there is no point selling — there would be no money in it," he said.

Memory prices tend towards a classic wave pattern, rising as demand outstrips production and then falling as new plants come on line. The popular idea

that production is deliberately kept low in order to push up prices is mistaken: a fab costs at least $1 billion and has to be kept running 24 hours a day to recoup building costs of at least $1 billion.

One reason for the recent glut was that fewer companies than expected upgraded to Windows 95, which is best run in at least 16Mb of RAM, and so companies had stocks to get rid of.

Accept no imitations — this is the only real Internet bible

The first issue of *Internet Advisor* is now on sale from WH Smith and John Menzies, priced at £2.95.

Internet Advisor is a new kind of Internet magazine straight from the publishers of *Personal Computer World*. It concentrates on giving business people the information they need to get online and make the most of the Internet and the World Wide Web.

Highlights of the first issue include tips on how to create great Web pages, a guide to searching the Internet, a case study on how the Manchester United football club Web site was created, and reviews of Internet Service Providers and HTML editors.

http://www.vnu.co.uk/advisor
● See the advert on page 120

Four in ten companies lack a PC

The growth of PC sales is slowing in the US, but there is a lot of slack left in Britain, according to the latest Banner survey. It reveals four out of ten companies with 50 staff or fewer do not have a computer.

Even more astonishingly, 1,213 of the 35,715 British companies with more than 50 staff have yet to computerise. Fewer than one in four one-person companies (self-employed people) use a computer; and the proportion rises to only one in three for five-person companies.

Software sales in Europe approached a record $2bn in the last three months of 1995, according to the Software Publishers Association of Europe. Germany and Austria had the highest growth at 39 percent, with England and Ireland coming in at 28 percent. Sales in Greece dropped by 13 percent.
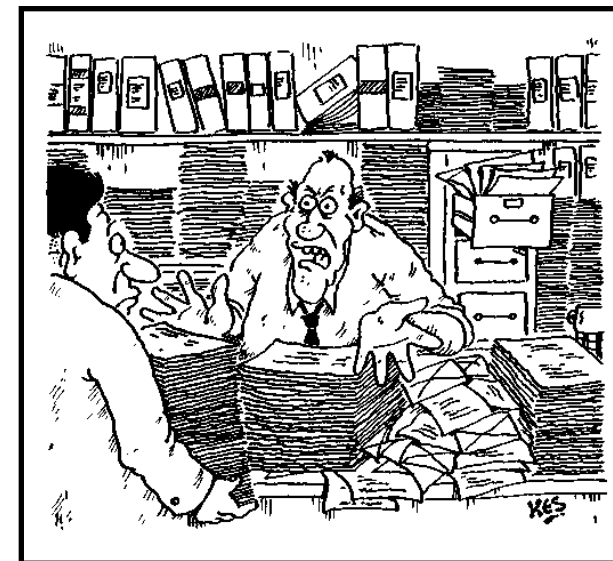
"Why don't I get a PC? Do a look like I have room for a computer in here?"

IBM/Cyrix 6x86 performance gives Intel a run for its money

IBM and Cyrix appear to be increasingly buoyant over the prospects of the 6x86 chip, which they believe has a real chance of slicing off some of Intel's market share.

The two companies are both partners and competitors over the chip, which Cyrix designed and IBM makes and both sell. It got a "Best Technology" award at Cebit and IBM cites figures showing it to be consistently faster than equivalent Pentiums in so-called "real world tests", which run a mix of applications typical of most users.

One reason is that the Cyrix design copes with 16-bit code better than the 32-bit-optimised Pentium and (especially) Pentium Pro. Of course, the Pentium might well outperform the Cyrix at tasks for which it has been optimised.
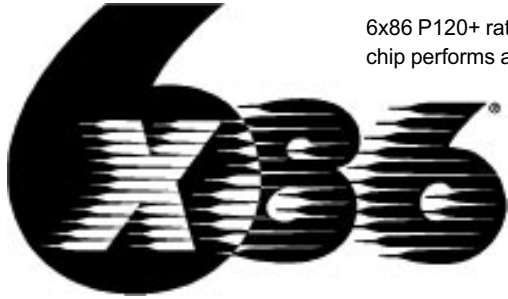
Yet oddly, the new IBM-Cyrix P+ rating system, which uses the Pentium itself as a measure of the 6x86, actually downplays performance differences. Thus a 6x86 P120+ rating means the chip performs as well or better than a 120MHz Pentium; but the P120+ chip is actually running at 100MHz. This slower speed has added advantages: it draws less power and produces less heat.

But Jim Dillon, European marketing manager for IBM Microelectronics Division, said that: "People see processor clock rate as a measure of performance. The P+ rating gives them a truer measure in a single, simple figure."

Amiga gurus launch TV presentation pack for PC

TV specialist, Scala, has entered the PC market with MultiMedia MM100 which it claims allows you to create multimedia presentations with the high impact of television.

It uses its own 32-bit object-orientated multimedia operating environment called MMOS, designed by the team who created the Amiga's operating system. But it will work with Windows or OS/2.

The £149 package, available later this month, looks totally different to Windows, and Scala says it breaks the pattern of traditional presentation packages.

Meanwhile, Strata has launched MediaPaint 1.0 for Windows 95 and NT, which it claims is the first workstation-class digital-video special effects and painting application for Windows.

Marketing manager Shelley Watson, said: "No other program in this arena has the special effects and particle systems featured in MediaPaint."

You simply draw a path for an effect and MediaPaint produces it over a series of frames. You can control several variables, such as speed and density for time-based effects including lightning, fireworks, lens flare and bubbles. Media-Paint costs £449 + VAT (RRP).

Strata has also released a multimedia authoring tool called MediaForge 2.0 for Windows 95 and NT with an emphasis on Web page production and CD games. Its MediaBasic editor creates unique options.

MediaForge will cost £995 + VAT (RRP) but there is an introductory price offer of £595 + VAT until late July.

Joanna Scott

Scala 01920 484811;
Principal Distribution 01706 832000

Short Stories

Crammer's software blooms for exam season

● Time was when well-off parents would pack off a lazy child to a crammer college. Now, thanks to the PC, the crammer college can come to you.

Abbey Tutorial College, which says it is among the most successful, has teamed up with Screen Active to produce revision software for three of the most taxing A-levels: Pure Maths, Physics and Chemistry.

You get a choice of examination boards and sets of questions and answers, with tips and revision notes.

The software comes on floppies and costs £107 per subject, or £235 for the three.

And, with GCSE exams also on the horizon, Acacia has issued its £45 Revise CD, for biology, physics and chemistry students.

ScreenActive 0181 332 2132;
Acacia 01730 268463

Pereos netted

● Datasonix, which claims its Pereos tape drive is the smallest in the world, has released a model with full network support. It stores half a gigabyte in a stamp-sized cassette.

Datasonix 01865 883302

Parallel ISDN

● Electronic Frontier is selling a £239 ISDN adaptor that fits into a standard PC parallel port.

Electronic Frontier 01734 810600

Hewlett-Packard drops Adobe PostScript

From the second half of 1997, Hewlett-Packard plans not to incorporate Adobe PostScript software in its LaserJet printers. H-P will provide PostScript-compatible printers but from that date will use clone software rather than Adobe's own.

Licensing PostScript software to H-P LaserJet products accounted for about five percent of Adobe's $762.3m 1995 revenue. John Warnock, chairman and CEO of Adobe Systems, said: "We are disappointed that we weren't able to reach agreement with some parts of H-P. However, we don't anticipate any revenue impact in 1996." Sourcing cheaper clone PostScript software will clearly result in a considerable saving for H-P, which it hopes will translate into retail price reductions, although this was not confirmed as an official reason for change.

H-P believes its own printer control languages are sufficient for the office environments where it sells in volume. PostScript clones will satisfy most others, while those in demanding publishing environments can buy official Adobe PostScript SIMMs from third parties.

The announcement, in Adobe's first-quarter results, came a month before H-P's launch of its latest printer control language, PCL 6. To be implemented initially on the forthcoming LaserJet 5, 5N and 5M workgroup printers, PCL 6 is a complete rewrite, using object-orientated code. The more efficient code, combined with faster processors and hardware acceleration of the new LaserJet 5 printers, results in time-to-first-page speed increases of up to 32 percent over the LaserJet 4(M)+ printers, which they replace.

The new LaserJet 5s offer 12ppm engines and 600dpi resolution, but infra-red is an optional extra. H-P is part of the IRDA committee and IR is standard on the older but still current 5P and 5MP personal printers.

The LaserJet 5 costs £1,220 (RRP), the Ethernet-equipped 5N, £1,429, while the 5M with Ethernet and PostScript costs £1,659. See next month's *First Impressions* for a full review.

Gordon Laing

LanRover puts 100 in the box

This is the latest generation of the best-selling LanRover remote-access box (*pictured below*), capable of catering for over 100 simultaneous calls. The new LanRover Access Switch uses a single primary-rate ISDN link to provide up to 60 analogue or basic-rate connections over a single cable, cutting down the need for complex cabling. More than one primary-rate line can be fed in.

It is targeted at companies wanting to ramp up their remote capabilities.It could also be used by Internet service providers because a single box can house up to 36 modems (12 per add-on board) as well as ISDN connections. All the incoming data is digital but each port can sense whether the source is analogue or digital and route it appropriately. Prices start at £19,000.

Compaq slashes network costs

Compaq claims its new "Netelligent" networking range will slash the cost of network products by up to 50 percent.

Hugh Jenkins, systems group product manager at Compaq UK, said: "We can offer a far superior price/performance than is currently being delivered by current leading vendors such as Cisco, 3Com and Bay Networks." The new product range will include network interface cards (NICs), hub and switch products, repeaters, desktops and servers.

Compaq's recent acquisition of companies Networth and Thomas Conrad gives them access to specialist networking technology, but all the products will be manageable from one Compaq platform: the Compaq Insight Manager.

Ian Whiting, internetworking product manager, said: "The marketplace up until now has been dominated by a large number of small players. This has led to a mystification of the technology used, and Compaq aims to demystify these processes."

Compaq 0181 332 3000

Jessica Hodgson

Bill Gates gave 4,500 developers in San Francisco a hilarious parody of what he called the Web's "gold rush mentality" with a mock ad inviting people to become publishers from the comfort of their homes. An actor said: "Mention the Internet in your business plan and you're sure to get funded."

Gates licensed his browser to AOL in return for sticking AOL's icon on the Win95 desktop (*Newsprint*, May). This will keep anti-Trust officials at the Justice Department off his back when he turns his own MSN into a Web service provider.

He will offer access from other providers as well as AOL. But he will make MSN access so simple that many Windows users will go for it. Gates may be late to the Internet party, but he is showing very quickly that he did not become a billionaire by sitting on his laurels.

Hurricane Heidi

Heidi Roizen, Apple's new VP of developer relations, became a multi-millionaire three years ago, having sold her T/Maker company. Having run one of the first Mac shops, she understands the trials of being a Mac developer.

Heidi was hired to stem the defection of developers from the Mac and get new ones into the fold. She told me she expected to get most calls from small developers needing Apple help; but the first to call were big companies planning to continue their support. She is determined to keep them happy while remaining responsive to the needs of smaller firms.

She also pulled off a major coup by setting up a full-page ad with glowing endorsements of the Mac by the likes of Bill Gates, Oracle's Larry Ellison, and Adobe's John Warnock. She is a one-woman tornado who will do a great deal to help Apple .

Fast US link heralds age of cheap communication

An announcement last month by Internet service provider, Demon, of a massive (by today's standards) new Transatlantic link could herald big changes in the price and scope of international communication.

Demon has leased a 45Mbit/sec line from British Telecom for three years at a cost of £15 million. That is more than the bandwidth available to all the UK Net service providers put together, according to Demon's managing director, Chris Stanford.

The move follows launches into the booming UK Internet market by two more big service providers, Europe Online and US-based Netcom, following in the footsteps of AOL, Microsoft and CompuServe. Most of these companies offer member-only services, in addition to access to the wider Net. Their charges are time-based.

Demon, which offers a few-frills connection for a flat £10 a month, aims to fight off the challenge by better and quicker connections. It virtually created the UK Internet boom by offering the first affordable service. However, Demon became the victim of its own success when it struggled to match demand in the face of a flood of complaints about connection problems.

Now it has a big new centre in London's Docklands, and local and continental connections have been boosted in line with the new Transatlantic link. Stanford said: "To all intents and purposes, we are as good as in America. Our connection to the US is as good or better than the connections of any provider in the US itself."

The deal's wider significance is that it shows the first sign of a crack in the unofficial cartel which has kept the cost of Transatlantic calls artificially high.

A fall in prices would not only threaten lucrative leasing deals, but also international voice-phone revenues.

People are increasingly using the Internet to make international voice calls for the cost of a local call.

● *News Analysis — page 36*

Demon 0181 371 1000

BT opens window on to virtual world

So what are we going to do with broadband interactive communication, if and when we get it? British Telecom invited journalists to its Martlesham laboratories last month to take a look at some of the ideas being explored there.

The VisionDome (*right*) is a prototype virtual-reality space that can be shared by up to 15 people, giving a full-colour hemispherical field of vision.

The resolution is low and the design leaves a lot to be desired (the projector could clearly be tucked away, or even placed outside the sphere).

But the US-developed dome shows the feasibility of the basic technology. It could be used, for instance, to provide soldiers with simulated battle experience, or give technicians "telepresence" in danger areas such as a nuclear reactor. Future tourists could explore the world without leaving their homes.

Other experiments in what BT calls

"shared spaces" are subtler. One involves using anti-noise to give true 3D sound to videoconferencing. Another area of research involves getting the faces of avatars (virtual people, representing real online users) to appear as if they were talking naturally. Martlesham has put some virtual-reality demos on to its site:

http://virtualbusiness.labs.bt.com/vrml/portal/home/

Hard worker
● SAIC claims this Field-works 5000 notebook can withstand a 100g impact and stay working, thanks to a rubber-covered magnesium frame. Options include 486 or Pentium processors.
SAIC 01276 675511

Can I quote you?
● The Collins Dictionary of Quotations is now available on CD-ROM, with around 18,000 quotes sorted into over 100 categories. At £19.95, the CD-ROM is better priced than the book and has the benefit of search tools.
GSP 01480 496666

Student offer on H-P printers
● Hewlett-Packard is bundling software packs with DeskJet 600 and 660C printers sold to students.

The bundles include Lotus WordPro 96, a 45-day trial CD version of SmartSuite 96 for Windows 95, and CompuServe software. An alternative offer includes Broderbund's Print Shop Deluxe and the adventure game, Myst.
Hewlett-Packard 0990 474747

TurboCAD hits top spot
● Sales of the latest Turbo-CAD 2D/3D have reached record levels, according to IMSI. The recommended price is £99.95 (RRP), but it has a street price of around £70 and has hit the number one position in Software Warehouse's Top 20.
• TurboCAD 2D/3D is reviewed in First Impressions (page 80).
IMSI 0181 581 2000

ISA bus could get lost in the great north/south divide

The antique ISA bus, a relic of the earliest days of the PC, would be phased out under proposals drawn up by a group of major chipset makers.

Their proposed new Common Architecture is independent of the main processor, giving a chance for non-Intel designs to find a market.

Backers of the proposals include National Semiconductor, Opti, VLSI, SMC, Texas Instruments and PicoPower. They say the plan will simplify PC design by enabling PC makers to mix and match components from any source, knowing they will be compatible.

The new design splits the PC into "north and south" components, straddling a PCI bus. North includes the processor (or processors) and a host controller that interfaces with the bus. Anything south of the bus, such as a graphics controller, does not need to know what is being used north, so long as it behaves in a standard way.

An ISA bus can be placed south of the PCI bus and connected to it by another controller. This allows for compatibility with legacy ISA devices, but it can be omitted. The first designs using the new
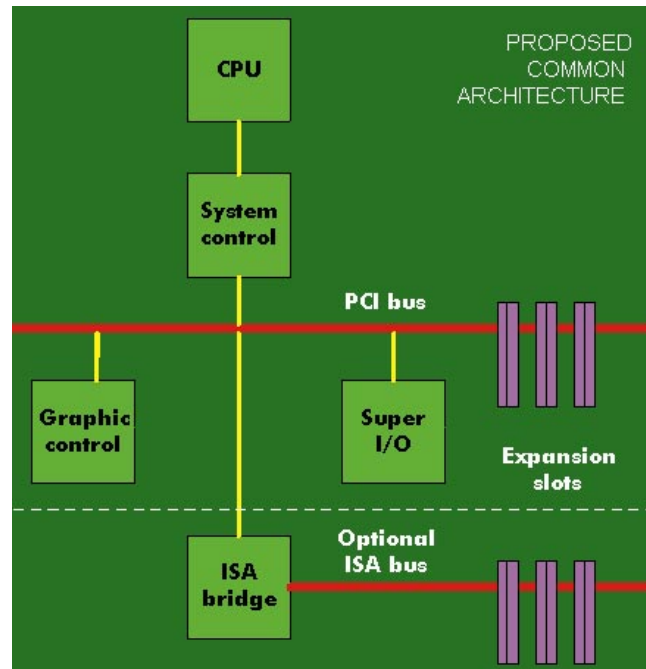
architecture are expected to appear next year.

Notable absentees among the backers include Intel, Apple, Motorola and IBM. The design has some similarities to the latter three's PowerPC platform. David Evoy, senior engineering fellow at VLSI, said the two designs could be reconciled and talks were under way to achieve that end.

He denied that the design was aimed at reducing the dominance of Intel chips and

insisted that Intel had been consulted about the design. "Whatever happens, most processors that go into these boards are going to be made by Intel. The way we see it, this architecture will do nothing but good for Intel, because it is providing a way forward for the PC."

But Intel spokesman Michael Sullivan said: "We have not seen the specifications. We could not make a comment until they have been fully studied."
Clive Akass

PROPOSED COMMON ARCHITECTURE

CPU
System control
PCI bus
Graphic control
Super I/O
Expansion slots
Optional ISA bus
ISA bridge

Intel keeps mum over Pro in the home

Intel is maintaining a discrete silence in the wake of stories of a cut-down consumer version of its top-of-the-range Pentium Pro processor.

The so-called P6 Lite chip, running at 233MHz, will power a new range of consumer PCs early next year, according to US reports.

The Pentium Pro was launched last year specifically for the demanding workstation and server markets. It includes,

uniquely, 512Kb of Level Two cache within the chip to speed up the data flow.

The P6 Lite chip is said to dispense with this cache to keep prices down to about $800 a chip.

There is also no word on how it will cope with 16-bit applications, which run slower on the Pentium Pro than they do on the Pentium because the former is optimised for 32-bit operation.

Intel spokesman Michael

Sullivan said: "We are on record as saying that the Pentium Pro is the first iteration of P6 technology and in the future we would expect to have different products. We have not commented on members of the P6 family that are currently in development."

He said Intel had made it clear that it would eventually target P6 technology at the consumer market, but not until 1997 or 1998.

Now it's datacoms by handshake

A handshake may one day be used to transmit information such as that contained on a business card, the MIT Media Lab's Neil Gershenfeld told an assortment of luminaries here.

He pointed out that our bodies can conduct electricity. Gershenfeld said that the handshake with a message was just one of the ideas being explored by MIT for turning the body into a data channel.

Gershenfeld was speaking at the annual UCLA multimedia roundtable, now renamed "Technology for the 21st Century". This invitation-only event, which I helped start in

*'We could use the human body to transmit data'
– Neil Gershenfeld, MIT Media Lab*

1990, has become a premier occasion for computer, consumer electronics, telecomms, entertainment, media and education executives.

Many of those invited are living legends. This year they included Intel co-founder Gordon Moore, who told the roundtable that he believed his

famous Moore's law (which states that the computer power you get per dollar doubles every 18 months) will hold true throughout this decade.

Artificial Intelligence pioneer Marvin Minsky, of the MIT Media Lab, said small cyberspace communites may become the

most effective way to discuss ideas without the pretensions often associated with face-to-face meetings.

Bob Lucky, formerly chief scientist at Bell Labs and now in the same post at Bellcore, the R&D lab for the Baby Bells phone companies, spoke about the continued problem of building a new broadband infrastructure. He believes it will take until well beyond 2010 for an optical-fibre network to reach into US homes.

Also present was Larry Roberts of ATM Systems, who designed and planned the development of ARPNET, the world's first major packet network and predecessor of the Internet.

Decade of the smart sensor

Paul Saffo, of the Institute of the Future, made perhaps the most profound prediction of the conference. He pointed out that each successive decade tends to be affected by a different technological invention.

During the seventies it was the microprocessor, which led to the PC revolution. In the eighties, laser technology impacted everything from printers to electronic communications. Saffo predicted that the next defining technology will be sensors — specifically, smart sensors on everything from packaging and toys to appliances and every sort of transportation system.

They will allow digital devices to interact in ways that control the time when a light goes on in your house, or use fuzzy logic to switch on a video camera when your child is about to score a goal in a football match.

Case for new metaphors

We may need to develop new metaphors to help naive users get into the interactive digital experience, according to Apple R & D chief Don Norman.

Norman, a world authority on cognitive science and author of many books on man/machine interaction, said the general belief was that TV, newspapers, magazines, and other media will move to a digital representation.

But he warned that the mechanism for delivering the bits and bytes could take many new forms. These may not immediately appeal to people who currently cannot afford a PC, or have no need of one.

He feared that if the old metaphors — such as Windows, menus and mice —were shoved down the throat of potential new users, they would never adopt technology that could truly impact the quality of their lives.

Faster Web links lead to Internet meltdown

Internet connections could get slower, even as people connect at higher and higher speeds, according to key participants in the roundtable, Bob Lucky and Thomas Freeburg.

They said ISDN and other fast-access methods will serve simply to speed up the meltdown of the Internet unless serious flow-control software and better switches are put into place.

They pointed out that US companies will soon be able to implement ADSL, a compression technology that can deliver over 1.5Mbits/sec through standard twisted pair lines. This will only increase the possibility that the Net will actually become a lot slower before it can become any faster.

Freeburg suggested that in the short term, solutions such as Direct Broadcast Satellites could be a good way to gain fast access to data. He cited as an example Hughes Network Systems' Insight system that can deliver entertainment and information via a set-top box.

Satellite links: could they be used to unclog the World Wide Web?

Psion PC buyer's guide and games

● Purple Software has launched versions of Backgammon and Chinese Chess (slightly different from the Western game) for the Psion 3a or Acorn Pocketbook, for £34.95 on floppy or £39.95 on SSD.

Psion has also announced PsiMail, which provides access to MS Mail and cc:Mail systems via a modem.

And Mobile Software has added a Psion 3a search engine to the CD-based Buyer's Guide from our sister magazine *What PC?*, with details of more than 3,000 hardware and software products,

Purple Software 0171 387 7777; Psion 0171 282 5580

Lonely Times

● The online edition of *The Times* has 27,000 readers a week, 14,000 more than *The Sunday Times*. The average daily readership is 12,000. More than three out of ten of readers are overseas; 13 per cent of those using the classified ads look at the lonely hearts.

Set a thief...

● Screen Thief claims to "capture screens other programs can't reach". Screen Thief 95, a new 32-bit version, can be downloaded from www.nildram.co.uk.

Nildram 01442 891331

Tax package

● Europress claims that its latest addition to the Mini Office range, Tax Return '96, will assist PC owners to fill in their tax returns correctly and avoid paying too much — which three out of four people do, the company says.

Europress 01625 859333

Men get key message about **RSI**

Men are more conscious than women of the health problems associated with working at a keyboard, judging by the results of a new survey.

It shows that well-off males between the ages of 30 and 54 were predominantly buyers of the Microsoft Natural Keyboard (see box, right), which is sold as "ergonomically friendly".

Only four in 100 of these men were unaware of Repetitive Strain Injury (RSI) and three out of four had studied ergonomic guidelines.

But Richard Teversham, Microsoft hardware product marketing manager, said that the figures probably also reflect the fact that the keyboard had received most publicity in computer magazines, which have a predominantly male readership.

The Conquest Research survey of 330 MNK buyers found that more than 95 percent would recommend the board to others. "That is an astonishingly high figure for this kind of research," said Conquest's Jill Bowden-Doyle. She stressed that the research was independent, even though it was funded by Microsoft.

Teversham also cited US government research showing that users of the MNK, Apple's adjustable keyboard and another US "ergonomic" model reported reduced discomfort.

But he admitted that the preliminary findings were unreliable, and that a placebo effect could be at work — people believe that the keyboard is making work more comfortable simply because they have been told it is ergonomic.

The spectacularly curved Microsoft model, much copied in cheaper versions, certainly *looks* as if it should help.

Conquest said users reported benefits from the MNK, whether or not they were touch-typists. This contradicted my own experience as a non-touch typist: the MNK, curved to fit the "proper" hand position, seemed to be harder work.

Teversham agreed that posture and mouse use are of greater importance than keyboard design in reducing strain. He said: "Much more research is needed."

Clive Akass

Crowning glory

The man with the Microsoft Natural Keyboard is Malcolm Jamieson, head of Crown Computer Products. He is showing off one of CCP's new PCs, which were designed via a satellite link by engineers in Hong Kong, Canton and Britain.

The VTech 586/133 uses an AMD 586 chip and costs £789 (plus VAT), with an 850Mb drive, 8Mb of RAM and a 64-bit Promotion graphics card.

CCP 01704 895815

Webbed Notes and pcAnywhere online

A Lotus package which lets you create and run Web sites using Notes 4.0 is available for download from www.inter-notes.lotus.com.

InterNotes Web Publisher 4.0 automatically publishes Notes documents, views and forms for use on internal or external Webs.
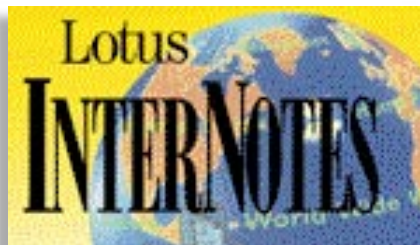
Quarterdeck, which has moved into Web software in a big way, extended its reach into the wider comms market last month with the purchase of Procomm Plus publisher Datastorm.

Procomm flourished long as a co-operatively developed shareware comms package. Its commercial incarnation, Procomm 3.0, runs under Win95 and 3.1 and includes fax and Internet software.

Quarterdeck has also acquired Future Labs, developer of a package called TalkShow, which allows remote users to collaborate on a common document.

Meanwhile, Symantec has made the latest 32-bit version of its remote control package pcAnywhere available on the Web on a 30-day trial basis. pcAnywhere 32 costs £139, or £59 with a free parallel cable for registered users of competitive products.

Quarterdeck 01245 491190; Symantec 01628 592222.

Short Stories

● This £299 infra-red driven touchscreen is said to fit any 14in monitor.

Ellinor 01734 311066

The voice of V.34
● Digicorp has launched a V.34 PC Card fax-modem that includes an analogue-to-digital converter to enable voice messaging. The company says that with extra drivers, the £210 CCM48T can also be used with cellular phones.

Distributors:

Northamber 0181 296 7000;

Ideal 0181 286 5000

Write on
● If you think a computer can improve your letter-writing skills, you may be interested in PlanIT Letters, a £49 package by Clive Goodworth, author of the *The Secrets of Sucessful Business Letters*. It claims to help you write both personal and business correspondence.

PlanIT 0181 875 4420

CD juke box
● Alps is offering one of the cheapest CD juke boxes yet, at just £223 plus VAT. The quad-speed device takes four disks at a time and fits into a standard 5.25in bay.

Alps 01344 873853

Tax advice
● Coopers and Lybrand has posted a Web guide for the nine million taxpayers who start self assessment this year. The address is www.coopers.co.uk.

MSN million
● The Microsoft Network has enrolled more than one million users since its launch with Win95 last August, the company says.

Microsoft 01734 270000

Network computers could kill off the fun office PC, says IBM

The days of the fun do-it-all PC may be over for many people working in big companies, IBM believes.

The company has six pilot schemes going with big users using different models of cut-down network computers (NCs) along the lines of those proposed last year by Oracle's Scott Ellison.

There are three big advantages as far as companies are concerned, according to Michael Lunch, head of the UK PC division:
● The cost of the hardware is lower, because of the lower specification.
● The cost of ownership (reckoned at between three and five times the purchase cost) is lower. One reason is that the machines are more easily administered, and unauthorised software — the source of a large proportion of problems requiring costly support — can be weeded out centrally.
● There is no threat to security, because critical data is not sitting on the terminal.

Tony Santelli, IBM's European product and brand manager, added: "Don't forget training, which is a major cost for most companies where there is a large turnover of staff. If you give people a fully-functioning PC they can easily get lost."

Lunch agreed that a move to an upgraded version of the old text-only dumb terminal, which flourished in IBM's mainframe heyday, would not be popular with power users.

"But they are not likely to be affected," he continued. "These machines will only go to areas where a fully-fledged PC is not needed."

Another factor in the NC debate is political. It could reverse the drift of management power from back to front offices which happened when desktop PCs got more powerful.

IBM steps on to the Mac platform

IBM could be selling machines running the Mac operating system early next year, European brand manager Tony Santelli predicted.

The machines will be based on the PowerPC platform, formerly called the Common Hardware Reference Platform, which will run NT, OS/2, Unix and the Mac OS.

Santelli said the IBM machines would be provided with a choice of operating systems. Asked whether IBM has licensed the Mac OS, he said: "You can take it that there are discussions going on about that."
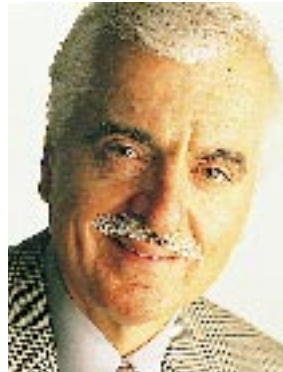
Mighty mouse

This is the latest mouse from Logitech, specially enhanced for Windows 95. The middle button calls up a palette around the mouse cursor, providing access to the eight most-used Win95 commands: start, minimise, close open windows, vertical scroll, horizontal scroll, resize open windows, and swap application windows. The new mouse is available now, priced £39.

Logitech 01344 894300

MacAcorn poised for schools market

The company set up by Apple and Acorn to exploit the education market was launched formally last month under the name Xemplar.

It claims to have the greatest installed base of machines in British schools, though this takes into account antique BBC Micros still doing sterling service after more than a decade.

Research Machines, which specialises in PC-based school systems, is ahead in sales. But Xemplar managing director Brendan O'Sullivan, former head of Apple Ireland, was optimistic about the new company's chances of regaining market dominance.

"People forget that schools are not the business world. They don't throw away old machines and they don't leave them in a corner, switched off. They keep using them on curriculum-based activities. So the first thing to recognise is that with our installed base alone we will be selling products for years to come."

He dismisses the argument, long thrown at Acorn, that there is no point teaching kids non-PC platforms. "All the major Microsoft packages are available on the Apple anyway. But Microsoft is not dominant in schools. Apple has the lead in education worldwide."

Acorn's Risc OS will continue to be supported, eventually being ported to the PowerPC Platform architecture, due to appear next year, which will run all the major operating systems. O'Sullivan said: "We will be offering the widest choice."

Xemplar 01223 724724

Chips off the old blocks

This is the kind of thing you can get up to with 3D objects and textures optimised by Ketiv Technologies for use with AutoCAD and Accurender ray-tracing software. They are on a $199 CD called The Blocks and Materials Library.

Aztec (dealer) 0171 987 6543

Short Stories

PCI-based DOS on the cards
● Apple was due last month to announce PCI-based cards that will run DOS applications, according to US reports.

The cards would come with a choice of a 100MHz Cyrix 5x86 or 100MHz Pentium processor. But they will reportedly cost in the region of £500 and £700 respectively.

The cards will come with DOS rather than Windows 95 because of legal problems with Microsoft.

SoftWindows speeds up
● The latest version 3.0 of SoftWindows, which allows PowerMac users to run Windows 3.1 and DOS applications, is said to run 35 percent faster than version 2.0.

You can load Windows 95 into it, although the speed is reportedly not great. Chris Cain will review it in next month's *PCW*.

More details on Insignia Solutions' site at www.insignia.com, or freephone 0800 667706.

Newsprint welcomes feedback from readers. Send your news and views to clive_akass@pcw.ccmail. compuserve.com, or call 0171 316 9317.

Top 10 Peripherals		Last
Product	Manufacturer	month
1 Quad-speed CD-ROM Drive	Goldstar	1
2 Epson Stylus Colour Printer	Epsom	9
3 28.8 Sportster Vi Ext	US Robotics	–
4 Online Internet Modem	Motorola	2
5 850MB IDE Hard Disk Kit	Western Digital	3
6 PaperEase	Primax	–
7 SoundBlaster 16 Value	Creative Labs	10
8 MS Sidewinder Joystick	Microsoft	4
9 MS Home Mouse	Microsoft	–
10 Iomega Zip Drive	Iomega	6

Top 10 DOS		
1 WordStar v6.0	Softkey	2
2 Flight Simulator v5.1	Microsoft	1
3 MS DOS v6.22 U/G	Microsoft	3
4 Sterling Payroll	Sage	–
5 Sim City 2000	Maxis	–
6 FIFA Soccer 96	Electronic Arts	–
7 Norton PCAnywhere v.5	Symantec	–
8 Fun School Maths	Europress	–
9 Fun School Spelling	Europress	–
10 Fun School 4 Age 5-7	Europress	–

Top 20 Windows		Last
Product	Manufacturer	month
1 Encarta 96	Microsoft	2
2 TurboCAD	IMSI	4
3 Pass Your GCSE Maths	Mathsoft	–
4 First Aid 95 for Win95	RMG	1
5 MS Office 4.2 U/G	Microsoft	5
6 MS AutoRoute Exp UK & IRE	Microsoft	11
7 QEMM 8	Quarterdeck	–
8 MS Office Pro 4.3	Microsoft	16
9 Cleansweep 95	Quarterdeck	10
10 MS Office Pro 95	Microsoft	11
11 MS Plus	Microsoft	15
12 Uninstaller v3.5	Microhelp	8
13 Dr Solomons Anti Virus Quarterly	S&S International	9
14 Dr Solomons Anti Virus Quarterly	S&S International	13
15 Quickview Plus	Inso	–
16 Page Plus Home/Office	Serif	–
17 CorelDraw 5 to 6 U/G	Corel	–
18 MS Office 95	Microsoft	7
19 MS Publisher v3.0	Microsoft	19
20 Corel Printhouse	Corel	12

Figures supplied by Software Warehouse and relate to bestsellers for March 1996.

The rocky road to Cairo

Microsoft is not meeting the new technology challenge.

MANY USERS BELIEVE that Microsoft is innovative and a technological leader. This is far from the truth. Indeed, it is hard to think of a single significant innovation by Microsoft.

Despite having Apple's GUI as the basis for Windows, it took more than nine years between Gates' first announcement and Windows 3.1, the first usable version. Windows NT (which despite its name had no new technology) took five years to produce. Windows 95 took four years from announcement to delivery and turned out to be Windows 3.1 on steroids.

Despite Microsoft's black propaganda campaign against IBM's OS/2 Warp, IBM is as likely to drop its operating system as Microsoft is to drop Windows NT and 95. Microsoft is very concerned that OS/2 is outselling Win95 and NT at retail, particularly in Europe. Microsoft likes to present the debate as being about upgrading to Win95 or NT: the best approach to this is to consider alternatives such as OS/2 Warp, Unix, NeXTStep, or staying with Windows 3.x.

Further delays were recently announced to "Cairo" (supposedly the coalescence of Win95 and NT with object technology) which will make it at least eight years from conception to the first version.

The further delay to Cairo has been attributed to

In the light of Microsoft's disappointing track record in sticking to software-release schedules, and its bullish attitude to upgrading, alternatives like NeXTStep could be considered

Microsoft's Internet strategy U-turn, with staff being distracted to make existing products work with the Internet. They needn't have bothered: as users already know, the Internet is increasingly grid-locked, making it too unreliable for serious business use. A more likely reason for the delay has been the disappointing sales of Windows NT Server.

So far as Intranet applications are concerned, in the next couple of years few corporate users are likely to do more than have a front-end from their corporate databases to an Intranet server.

Microsoft encouraged expectations for Cairo to rise, but has found itself unable to deliver on its promises. Cairo has been recently de-scoped: it will no longer have a global directory service, nor an object file system. Instead, the distributed filing system is to be based on Exchange Server 4.0 (as it is being called, despite being the first version). Microsoft's competitors were delighted. The company has been forced to admit that Cairo will not now be delivered before late 1997 at the earliest, but no bets are being taken.

A couple of years ago, Microsoft's object technology strategy paper said that "object-orientated programming is a way to develop software by building self-contained modules that

can more easily be replaced, modified, and reused." So far, so good. But then, in the next sentence: "But object-orientated programming technology has failed to fully address the need to simplify application development."

It seemed that Microsoft either found object technology too difficult, or, more likely, did not like the idea of promoting a technology that would allow users to pick best-of-breed software that could work together under rules established by industry agreement and business needs, rather than proprietary specifications controlled by Microsoft.

To keep its proprietary control Microsoft is trying to add to OLE, functionality it was never designed to have: distributed objects, security and directory services. Even Microsoft's avid supporters are concerned that Network OLE cannot achieve this.

Another technology that Microsoft does its best to ignore is middleware — what comes between you and your data. The company could never dominate this growing sector and doesn't like to admit that Microsoft and non-Microsoft products can be connected in this way.

As a result of Microsoft's failure to deliver to schedule and its retreat from state-of-the-art technologies like object orientation, many smaller corporate users are joining the move by larger businesses towards object management standards — essentially an MS-free zone.

The new mood is towards software serving the needs of business. The days of sheep-like adoption of software produced by business-ignorant boys and girls in Redmond, and chancing a business to the ill-defined and ever-changing plans of a single vendor, are gone.

Graham Lea

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IN SILICON VALLEY, A company with legendary status is Xerox's Palo Alto Research Corp. Unfortunately, Xerox PARC is best known for lost opportunities. Its most famous blunder was to create the graphical interface and then let it get into the hands of Apple, which turned it into the Mac interface.

The page description language was also invented at PARC, but the creators, John Warnock and Chuck Geschke, had to leave Xerox and start Adobe to make it a commercial success.

Now Xerox PARC has started a subsidiary, called dPIX, to help it capitalise on its creations, and its first product could be a big hit. It is a 13in flat-panel LCD screen with seven million pixels and a resolution of 3,072 x 2,240. This is the highest-ever resolution on a PC screen, cathode-ray tube, or LCD (SVGA starts at 640 x 480).

Initially these screens will be very expensive and targeted at the aeronautics and medical industries, to be used as navigational output monitors on planes and in various medical imaging products. They show us the future of display technology. Many believe that in a few years, flat-panel LCDs will

Talkin' about a resolution

The highest-ever resolution on a PC screen heralds the future of display technology, writes Tim Bajarin.

completely replace CRTs in desktop computers. But don't expect the Xerox models in the consumer market for a while yet. Xerox will be making them in limited quantities at first, but may later license them for larger production. I don't think we'll see high-definition colour, flat-panel LCDs for the mass market until 1999 at the earliest.

● On a similar note, you may have noticed that prices of notebooks with active-matrix colour LCD screens have dropped a lot over the past year. This is because more

factories, able to produce them in large quantities, are coming on line. Sharp, the biggest supplier, has opened two new plants. Toshiba has increased output too, and Korean manufacturers have started cranking out these screens in big volumes.

So, a 10.4in active-matrix screen that cost PC vendors $950 in late 1994 was selling for just under $500 last autumn. However, now that we can get 10.4in active-matrix based notebooks at a reasonable price, these LCD screen makers are starting to deliver 11.3in and 12.1in screens for use in portables. I got a chance to see the new H-P OmniBook 5500 recently with the new 12.1in screen in it. Result: a bad case of techno-lust.

A 12.1in screen costs notebook makers well over $1,100 today, so the new 11.3in and 12.1in models are going to be pricey. But you should take a look at them if you are thinking of buying a new notebook.

Dr Charles M "Chuck" Geschke

Japanese set to blot US notebook market

An interesting war is about to erupt in the US notebook market. Japanese vendors such as Fujitsu and Hitachi will enter the US with models in every category, with a potentially devastating effect on existing vendors.

The US market for notebooks grew at only 12 percent in 1995, according to the International Data Corporation, compared with 25 percent in 1994. With more vendors and a slowing of growth, a real shake-out could occur.

Players like Apple and Compaq, which have lagged behind in innovation, could get hurt if the

Japanese get aggressive with pricing in order to buy market presence and quickly gain channel acceptance.

When Fujitsu decided to aggressively enter the mainstream desktop market in Japan, it priced its systems so low that it almost killed Apple and prevented Compaq and Dell from getting a serious foothold there. My Japanese sources say that Fujitsu's pricing, which was as much as $200 under cost on some models, was designed specifically to ensure Compaq and Dell did not gain ground in Japan.

The word is that Fujitsu will spend

close to $21m to launch its portable line into the US this month, suggesting that the company has an ulterior motive. Many feel that both Fujitsu and Hitachi are using portables to open up new channels and strengthen their brands in a bid to make them household names by next year, when they will bring new digital access devices to the US consumer market.

In the short term, Fujitsu is bound to hurt the traditional notebook players if it undercuts their prices significantly. That could cause a real price war in which only the big players may survive.

Cranking up the bandwidth

BT is selling a faster Transatlantic link. It's good to talk about this as a pointer to the future, says Clive Akass.

DEMON INTERNET'S new 45Mbit/sec Transatlantic link merited its flash press launch at the Ritz. But to an outsider, the most surprising aspect was not how *large* was the capacity of the line about which all the fuss was being made, but how *small*.

British Telecom officials tell me that the entire Internet traffic that BT pipes between Britain and the US peaks, at the moment, at 8Mbit/sec. This does not include private business links. It is nevertheless at least a couple of orders of magnitude less than you might expect from two whole countries talking to each other.

Consider that the average office network chugs along at 10Mbit/sec and that can soon get clogged up if you throw in a bit of multimedia: 1Mbit/sec is considered about the lower limit to deliver acceptable MPEG video.

Clearly, if people could afford to download videos from Hollywood, or talk face to face on a see-phone with Aunt Fanny in Baltimore, or play network Doom with cousin Joe in

Cliff Stanford, managing director of Demon Internet: his company's 45Mbit/sec Transatlantic link signals a more open mood in Internet technology

Peora, they would do so. Companies would have even more reason. Bandwidth would sell by the gigahertz if it were cheap.

And bandwidth *is* cheap — to the people who own it. That single 45Mbit/sec link is a fraction of a hair's breadth of a single strand of optical fibre. There are bundles of fibre going under the Atlantic: gigabyte upon gigabyte of bandwidth, much of it unused.

A 2Mbit/sec connection, by one measure, actually costs the providers more than a 45Mbit/sec one because of the need to multiplex down (i.e. divide the capacity into distinct channels).

Bandwidth is like diamonds. If you restrict sales, like the diamond cartel does, you keep up the prices. You can charge millions for a connection that costs you no more than a domestic phone line.

On the other hand, if you don't restrict sales, you could shatter the current revenue structure of the phone system. People with bandwidth to spare could sub-lease it for standard phone calls: at least one company is already offering Internet users Transatlantic calls for less than 10p a minute.

Clearly, there are some

tricky transitions to make on pricing structure, as well as on technology, before the fabled Information Superhighway (as opposed to the current dirt track) reaches our doorsteps.

BT took a first step earlier this year when it published prices for its ultra high-bit lines. These have been a hitherto closely guarded secret and their publication is expected to stimulate competition and price reductions. Demon's 45Mbit link, the first BT has sold, is a fruit of this more open climate and is thus a pointer to the future.

But there is a huge technology shift to come. BT researchers at Martlesham have set up a pilot network in which even the switching is carried out optically, photon by photon. A single channel can offer a bandwidth of hundreds of gigahertz: more than 1,000 times as much capacity.

There will be no more jerky video links with that setup. You're talking high-definition television, in spades.

Nerd regrets

An apology is due to the makers of Channel 4's "Triumph of the Nerds" for an unenthusiastic notice in last month's *Newsprint* (page 19). It was a result of my irritation at the way newspapers and television sneer at youngsters (and, indeed, oldsters) who are interested in computing, which is routinely associated with the word "nerd". Small wonder that Britain is not producing enough technologists.

But the first program (the only one screened before we went to press) was excellent and fully justified the title. It defined a nerd as someone who used a telephone to talk about telephones.

Thus myself, using my first aged word processor, deciding that what I was writing on was more interesting than what I was writing. So I am a nerd, and proud of it.

On a natural note, Microsoft's still flat

Listening to Microsoft's spiel about the pros and cons of its natural keyboard (*Newsprint*, page 28), I was struck by the thought that the first change I would make to a keyboard would be to move the Caps Lock key.

Several times a day, and sometimes several times an hour, I hit this key by mistake yet I hardly ever need to use it. The key is absurdly

positioned and must be responsible for thousands of lost person-hours of work across the country each year.

My Gateway keyboard allows me to remap it out of the way, but there should be a remapping option within the operating system. Odd that Microsoft, for all its usability labs, could overlook something so simple.

Computations

BY ROWLAND MORGAN

STATELLITE-PAK

➔ Percentage increase since 1978 in information technology capital investment per white collar worker: 10,000. Accompanying percentage increase since 1978 in white collar productivity: 0.
● **Source: Rebecca Rudd, Focus, *Carnegie Mellon Magazine*, January 1996.**

➔ If America's home computer screens were laid down flat together and used as a football field, all soccer's Premier League teams could play each other on a different pitch with at least 100 pitches to spare.
● **Source: Predicast/Fortune (30m units in 31 percent of US households; 20 teams; 400 matches).**

➔ Boxes of personal computer units shipped by Japanese manufacturers in a recent year could have filled Wembley Stadium to the top of the terraces.
● **Source: Independent on Sunday (2,309m units @ an average 0.5m^3 / Wembley, 1million m^3).**

➔ A police officer could examine a conviction filed on the Police national computer every ten minutes of the working day, for 373 years.
● **Home Office (3,956,026).**

➔ One copy of each of the world's computer magazines would stack eight storeys high.
● **Source: Kaleida Labs (1,900 @ 1.5cm).**

➔ A year's raw plastic pellets for UK-made computer casings could jam six lanes of the M1 motorway with nose to tail juggernauts for over a mile.
● **Source: British Plastics Federation (19,200 tonnes).**

➔ In the eighties computer boom, the Ministry of Defence was spending more than £40,000 per working hour purchasing computers, or £232 a year per member of the armed forces.
● **Source: UK Ministry of Defence (£355.5m at 1986-90 prices).**

➔ Each American man, woman and child's annual electricity consumption could run about 100 personal computers. That of their African counterparts: two.
● **Source: The New Book of World Rankings (19,955/369 kW/hr per year).**

➔ The clock speed of IBM's AT model, the leading-edge personal computer of 1984, was 27 times lower than today's 166MHz models.
● **Source: IBM (80286 at 6MHz).**

The Green-Gauge

Personal Computer — Oracle network computer	
Energy Saving:	15W max draw
Take-Back:	No
Polymer Codes:	Yes
Packaging:	t.b.a.

Laser Printer — NEC Superscript Colour 3000	
Energy Saving:	Power-down mode
Take-Back:	No
Wattage:	5
Packaging:	All cardboard
Recycling:	Plastic codes

Hungry PCs gobble half the output of a big power station

Solar computing

Between 150 and 200 million personal computers are working now, drawing at least 37GW, or the output of 15 major traditional power stations. As with all technology, the installed base is already obsolete, although critical mass of investment will yet drive it forward. All processing will go virtual, handled on central servers like telephone exchanges. Energy-guzzling PCs with hot memory banks requiring fans and their own monitors will be replaced by "toasters" costing little more than a telephone and there could be a saving of 34GW, or about 16 power stations — half the power produced in Britain.

Desktop computers in this country, say five million, currently capable of drawing at least half the output of a big station like Didcot A (its cooling towers are visible up to 15km west of the M40 on the Oxon/Bucks border), could be phased out and replaced by little appliances drawing one-tenth to one-twentieth the juice. In fact, a silicon plate on the roof could easily power each network computer and, incredibly, disconnect all infobahn users from the grid.

Megawattage of a typical power station (Didcot A): 2,060MW. Wattage of the power supply unit of an Oracle Network Computer for corporate use: 15W.
• **Sources: *Newsweek*, 21st February, 1994/Oracle/The Electricity Association.**

Sounding Off

I am a lazy bastard, of the "work fascinates me, I can look at it for hours" school of thought. If I can get someone else to do it for me, I will.

Unfortunately, I have so far been unable to extend this noble concept to physical exercise. This is a pity, because nine months ago a combination of sloth and fatalism induced me to resign my health club membership. Since then, impressed by my burgeoning, beer-induced bulk, lard companies have been pressing me to accept sponsorship deals.

The situation reached crisis point just after Christmas, when a second pair of trousers exploded, showering innocent passers-by with potentially lethal fragments of zip. I resolved to jog three miles each morning. There was a problem, though. Not with the jogging —I didn't get that far. The problem was in getting out of bed in the morning to do it.

Fortunately, it looks as if computer technology could soon come to my aid. While leafing through *The Spectator* the other week, I came across an advertisement for "*The* Bed". Although the accompanying photograph makes the thing look rather like a slug in traction, I reckoned it must be something special (after all, not even *The Guardian* underlines its italicised definite article) and I was right: further reading confirmed that the virtues of *The* Bed are many: "Flexible, versatile, and luxurious with the technology to meet your demands" boasts the blurb. "It could be the most comfortable bed you'll ever own."

What you get for your money is a custom-built rig, matched precisely to your personal height, weight and build. If there are two of you, you've got to supply the manufacturer with your partner's dimensions as well to prevent them dropping off the end or getting absorbed into the duvet.

There's a five-phase temperature control which heats the mattress to

MICHAEL HEWITT

your specifications. There are four, inbuilt motors which allow *The* Bed to be manoeuvred into any position you require. Then, when you get up in the morning it will automatically air itself, which must be quite something to watch.

Anyhow, something like this could well be the answer to my inertia problems. At the moment, when the Psion goes off at 6.05am I perform a quick mental calculation, comparing my current temperature to the likely outside air temperature. If I reckon the street is going to be more than 20°F cooler (Celsius is for anoraks) and in my imagination it invariably is, I say "sod it" and go back to sleep. But *The* Bed will help overcome this.

An interface from the Psion will kick in at around 5.00am. The program will tell *The* Bed's thermostat to set itself to "cool". Not too cool, or I'll end up in cryogenic suspended animation, but just

enough so that, by 6.05am, the outside temperature should be a good deal warmer than the interior of my bed. This should provide sufficient inducement to get me up off my back and into my trainers.

If it doesn't, Phase 2 of the wakeup program will be executed. This will operate *The* Bed's motors. Normally, these work in unison to gently lower and raise different sections of the frame. However, boosted by a powerful transformer, they could be made to emulate the pop-up action of my Rowenta toaster, tossing me through the air in a parabolic arc. Thereafter, a proximity detector built in to the bedhead will resist any efforts by me to get back in: the frame will snap at me like a pair of jaws. Indeed, if I automate my bed-settee as well, the two of them could combine to drive me out of the flat and see off any potential burglars in my absence.

Thinking further, I see no reason why other household objects couldn't be turned into useful, health-inducing computer peripherals. *The* Fridge is an obvious choice. At the moment, my frost-free Hotpoint will let me put in and take out any old stodge: ice cream, oven chips, pizzas — you name it. But an OCR scanner built in to the door could read the fat and calorie ratings of the outgoing foodstuffs and relay the information to my PC. Once the FlabScan software has decided that I've exceeded my daily calorie allowance, it will automatically lock the fridge door and blow a barrage of frozen peas at me if I try to force an entry.

Then there's *The* Chip Pan. An interface between this and *The* Electric Oven will keep watch on my fried food intake. More than two fry-ups a week, and the electric rings will automatically shut off and fire up servo motors in *The* Salad Bowl, which will load itself with chopped cucumber, tomatoes, and celery, and propel itself relentlessly...

Forget it. I shall just resign myself to going down the Orson Welles route. ◼

Homefront

When April's *PCW* arrived, I turned first, as always, to read the wise words of our editor (*can I have that rise now?*). I was shocked to find he had written that Microsoft's Encarta cost £299

when it was first released. *"Shurely some mishtake," I thought.* Rummaging in the archives, I dug out the original *PCW* review from August 1993. And yes, there it was; £299. What's more, I'd written it, and nowhere in the text did the words "expensive" or "who do they think they're kidding?" appear.

Now, less than three years later, the latest "World English" version, in which some of the US-specific contents have been ditched to make room for really important things like cricket and the Archers, can be bought for less than £50.

It is certainly good value, but it was equally good value when it first came out. What has changed is our perception. In those days, when a new-fangled double-speed CD-ROM drive, soundcard and speakers cost around £400, CD-ROM held the status of small objects of desire. Now, we see CD-ROM for what it is — a cheap way of reproducing large amounts of data. Most computer magazines give one away each month, and it's getting increasingly difficult to find "home" titles of any description that come on floppy.

The market has matured. Much of the utter rubbish pushed out in the first wave of CD marketing has disappeared, and the sheer quality of some of the current titles is astounding. Those already in the business, such as Microsoft, Voyager and the Discovery Channel, continue to provide a stream of informative and entertaining products. Some of the traditional publishing houses have grasped the multimedia nettle in an extremely competent way: Dorling Kindersley's splendid, visually-rich, reference offerings such as Stowaway or the Eyewitness series, for example.

So, how are we doing in the world of fiction? Specifically, titles that are going to enrapture younger children. After all,

TIM NOTT

there's a wealth of creative talent, much of it British, in the field of children's writing and illustration just begging to be brought noisily leaping off the page via multimedia. Many parents and children are familiar with the wondrous versatility of the Ahlbergs, the brilliant anarchy of Tony Ross, the messy mastery of Quentin Blake, or the near-photorealistic surrealism of Anthony Browne.

So when a great British publishing institution, such as Penguin, hits the streets with multimedia titles, it should be time to get excited. When the catalogue (itself on a CD) landed on my desk it got priority treatment. For the adults there are Penguin-ish highbrow subjects — Arthur Miller, Jack Kerouac and opera. But for the tinies, out of the vast range of talent available, what do they offer us? Beatrix Potter and Topsy and Tim.

The first needs no introduction. Though it's brought up to date with animation and music, the pictures remain faithful to the original. Unfortunately, so do the attitudes. The guys get to do the fun things like fishing and growing things, while the gals are stuck with washing and sweeping.

Topsy and Tim's world is a rather more recent time-warp — the tiny twins live in an unblemished suburban Utopia where the most challenging event is Grandpa losing his glasses.

What both series have in common is that they are loathed by all the parents I know and unheard of by most children until, alas, they are bought by grandparents.

They're dull, insufferably cosy but "nicely done". So nicely, in fact, that it makes you wince at the lack of imagination. And the price? £29.99. Sure, the story gets read out, there's some simple animation, things to click and games to play, but basically, Topsy and Tim is a 28-page story book. A far cry from the Dorling Kindersley or Microsoft value- and content-packed products.

Compare this with the products coming from US software houses, such as Seventh Level, whose showbiz approach to "tinies" products such as Tuneland features zany animation and singalong music recorded by real musicians. It's similarly depressing to realise that, on a (slightly) more adult level, it took this same US company to do justice to that venerable British comic institution, Monty Python.

The whole point of multimedia is imagination. And that is what is lacking on the UK storytime scene. There are a few notable exceptions, such as the Oxford University Press story books which combine the creative talents of John Bush and Corky Paul with the recitative skills of Robbie Coltrane and Sandi Toksvig.

But if major UK publishers such as Penguin want to appeal to today's "wired" families, they're going to have to dig a little deeper than the flightless fossils of Topsy, Tim and Peter Rabbit.

Straight talking

Sincere thanks to the many dozens of readers who are still faxing me hints, tips and thoughts on Holy Grail fax software.

Sheer weight of numbers makes individual replies impossible.

The exercise confirmed my suspicions that the companies who market fax software, and the PR companies who promote it, know zilch about what they are selling. This helps explain why the majority agree that virtually all fax software is flawed. "Couldn't agree more", "hit the nail on the head" and "hit the spot" you kindly wrote, suggesting: "the best of a bad bunch".

For those of you who missed the original question, a couple of months ago I asked whether anyone knew of a fax software package that is reliable and is not overburdened with daft features. Who really needs a disc full of cover sheets saying things like: "Here's your fax, dude"? More to the point, who even thinks we need them?

I asked several software companies for Holy Grail suggestions. Most of them ignored me. More than two months late, Shandwick PR, on behalf of Symantec, sent me a copy of Delrina's Winfax Pro Version 4. This was released before Windows 95 and carried an upgrade offer that expired last December. Are you really recommending people buy this outdated product?, I asked, but got no answer.

Two people from Text 100, who represent Microsoft, phoned separately to say they could not help, because Microsoft did not do any fax software. As several readers have pointed out, Microsoft gives away good fax software as part of Windows 95. The extraordinary diversity of opinion on what is good, bad and useless clearly shows that fax software which works well with one modem may fall down with other brands. There is no way to predict how anything will behave when sending to other fax software or standalone fax machines.

A couple of readers recommend the fax facility that came with WordPerfect for DOS. Remember WP? Likewise, several people

B A R R Y F O X

seemed happy with Fax Works, which apparently comes free with OS/2 Warp. Remember Warp? It's the operating system which IBM was going to make the industry standard. OS/2 now seems to have sunk without a trace, along with IBM's interest in communicating with the press.

One reader's comment made me quite glad I never sacrificed my PC to OS/2: "My son set it all up and he has forbidden me to change anything — on pain of being boiled in oil for three minutes while he thinks of something really unpleasant." Another reader suggests using the Psion 3a with 3Fax modem. Yes, it does work. I've fiddled with it from hotel rooms. But who could seriously do a day's work on a 3a keyboard?

A couple of people recommended Arcfax, but as it works only with an Acorn Archimedes, it must be of limited interest. Trans-Send has one devoted fan. So does Smartcomm Fax for Windows and Fax Now from Iconographic Systems. Several people

recommended Bit Fax and Bitware, from Cheyenne Communications. They had all got it free with various modems.

A similar number had got Quick Link II free and like it. One noted just what I found. It is choosy about modems, and fails to connect with some fax machines unless you try at least three times.

Likewise, many people seemed quite happy with Winfax Lite, which is also given away free with modems. But those who pay to upgrade are not so happy. "I got so angry with the stupid program," wrote one reader of Delrina's Winfax Pro and Commsuite 95, "that I've erased every particle from my hard disk. I daren't give it away, as I would be so embarrassed." Another who upgraded from Winfax Lite to Pro 7 is so unhappy he has asked Delrina for a refund.

But someone else reckons "Delrina 4 in 1" (whatever that is) is the bee's knees and is saving up to buy Commsuite 95. A colleague uses Winfax Pro, and tells me the only way to get good help is to bypass the UK operation altogether and phone Delrina's HQ in Canada.

A reader from Sussex has solved his software problems by buying a standalone fax machine with serial input for ASCII from a PC word processor. He, and others, share my concern over leaving a PC on all year round to receive faxes. Mr PT of what may be a Dutch address should check what he is using; his fax came over as garbled graphics. Mr PD and his son ND from Newry, should check what they are using too. Their fax came over the size of a postage stamp. Mr GH of Hull tried many times to send me a message, but the most I ever got was a cover page.

Several readers asked for advice. The only clear fact to emerge is that there is no such thing as a Holy Grail package. Nor is there ever likely to be, until the software companies and their PR representative take the time and trouble to ask customers what it is that they really want.

The best fax software often comes free, bundled with a modem or operating system. That way, at least you know it will drive the modem. And it may well be much better than an expensive upgrade. ◼

Business matters

I have hazy memories of visiting a circus in the dark ages before Linda McCartney, when nobody worried about the ethics of animal acts.

I didn't enjoy it much, particularly when a sad-looking elephant was paraded around in silly clothes. This image surfaced when viewing the efforts of the business world to come to terms with the World Wide Web. Perhaps a more precise picture is a bunch of elephants attempting to ride bicycles. This combines the herd instinct with the sheer incompatibility of a large company bureaucracy and Internet communications. Let's look at the diary of a corporate enthusiast setting up a Web page:

May 2 — got the go-ahead for the Superco plc home page.

May 16 — Took a prototype to the working group. They were impressed — referred me to the head of department.

June 1 — Head of department back from holiday. Demonstrated the final version of our home page. Boss impressed with final version of home page, wants the detail okayed by the corporate design team. Hope to be live by the end of the month.

July 15 — Corporate design request that we make the pages less wordy.

August 1 — Corporate design engage a consultant.

October 16 — Design consultant reports. The graphics will be difficult to reproduce.

November 23 — Pages to new specification available. The home page takes half an hour to open with a 14.4 modem, but looks wonderful. PR department finds out about the Web site and demands a veto on all material.

December 24 — Pages reworked to PR department's specification. Discover that www.superco.co.uk has already been taken. Legal department instigate proceedings.

December 31 (11.59pm) — Pages go live.

January 15 — Advertising campaign in the papers. Unfortunately, the URL for our

B R I A N   C L E G G

page is printed so small (the agency didn't realise it was important) that nobody can read it.

Unlikely as it sounds, this is entirely modelled on the experience of real firms. What went wrong? It started with that herd instinct. The company didn't think through the reasons why potential readers would want to look at the site, they just knew that they ought to be on the Net. The trouble is that apart from selling products or disseminating useful information — prices, timetables and technical help — the only reason for having a Web site is to "promote corporate awareness". Like Esso's unlikely association with tigers, they aren't pushing a product, they're merely imparting a warm glow.

On the TV, a warm glow may well be achieved by showing magnificent images, but there's a big danger in moving to the different medium of the World Wide Web without a

radical shift in approach. Most Web-users are struggling with the limitations of modems, and don't want a half-megabyte download each time they open a page. Marketing people have to deal with a world turned upside down. Until now, advertising has been tolerated because it subsidises the surrounding material. On the Web, glossy ads don't reduce viewer's bills, they *increase* them.

There are, however, at least four ways to improve your image via the Web. You can be cool, serving up the latest goodies. The hallmark of a cool site changes from month to month, but in the past this has meant animations, personalised pages and Java applets. You can simply entertain people, an approach that companies as diverse as Levi Strauss and Tango have taken. Perhaps the most effective approach is to supply a real information need — ideas range from sponsoring a popular utility such as a search engine to supplying up-to-the-minute stock market quotes. The most radical approach, which I'm not aware of happening yet, is not having a page at all, but paying a service provider to give free access to the Web — this would certainly boost the corporate image.

Even if the company successfully negotiates the content minefield, there's always the temptation toward graphics overload. The extent to which some companies police their corporate image is positively terrifying. British Telecom has a manual which describes exactly the way their logo should appear on a computer screen. While I enjoy graphics as much as the next person, I think they're over-used on the Web. I gave up story books with pictures a long time ago — they're often more of a limitation than a help. I've put together my own site which limits the use of graphics while getting a message across: see what you think at http://ourworld.compuserve.com/homepages/BrianClegg

It's not that business should stay away from the World Wide Web — far from it. But the marketeers have a lot to unlearn. ◼

Letters

Throwing stones

Hull isn't the first place to spring to mind when one thinks of ivory towers. However, Peter Styring (Letters, PCW May) has clearly been sniffing too many of the substances in his chemistry lab.

I am an engineering consultant who has to earn a living using computers, as distinct from just knowing how to use them. I can assure Dr Styring that the benefits of the Macintosh, to those of us who are not lucky enough to be paid regardless of whether they actually earn a living or not, grossly outweigh any benefit from the character-building aspects of struggling with the various (outdated, and constantly changing) PC operating systems. Because of the needs of my (unfortunate) customers, I run Macs and PCs side by side, and I am in no doubt which wastes more of my time and money.

I concur fully with his sentiments regarding the lamentable lack of arithmetic ability in today's students (and I speak as a physicist who failed two maths A-levels, so I should know). However, if Dr Styring seriously believes that the nation's prosperity relies on the abilities of its school-leavers to waste their employers' time on setting up computer systems, I would respectfully suggest that the sooner he is relieved of responsibility for the education of even a small part of the nation's youth, the better.

I shudder to think of how much money is wasted in the Western economies as a result of poorly engineered operating systems and hardware which take hours to set up and learn to use. I fervently hope that "plug and play" will go some way to improving matters, but it still has a long way to go to catch up with the standard set by Apple over ten years ago.

One presumes that the washing in the Styring household is still done on the stones on the banks of the Humber.
Nick Williams
nick@confmnce.demon.co.uk

Straight to the source

Regarding John Steel's letter concerning sourcing batteries for portables (Letters, April), I have a catalogue from a company called GMK Services which has five pages of laptop/notebook battery packs. There are also many other types of battery including mobile phone batteries.

It will also refurbish battery packs where supplies of the original battery are scarce. Its address is: Venture House, Cross Street, Macclesfield SK11 7PG (tel 01625 511583) — it may well be worth a call. Hope this helps.

Andrew Paterson
101454.1250@compuserve.com

Still the Gateway to hell

I recently sent a laptop to Gateway for servicing, having been told that its turnaround time was a week. After a fortnight I hadn't heard a word. I called, and was told that the motherboard needed to be replaced at a cost of £910, which by any standards is daylight robbery for a DX33 motherboard.

I reluctantly decided that it would be better to buy a new laptop, but in the meantime I tried to speak to the person in charge of the service department to discuss the options available to me.

Typically, for Gateway, she was never there when I called and never returned my calls in spite of the most ardent promises from customer services. After a week of trying to speak to her, I bought a new laptop from a different supplier. Two weeks later I received a pro forma invoice from Gateway for the replacement of the motherboard. The amount on the invoice was £225. You can imagine how I felt.

I called Gateway to ask for an explanation of this difference: the company accepted that I had been quoted £910, but said that it had received massive discounts from Microsoft and Intel and so were going to be selling replacement motherboards at the reduced price with effect from 1st April. As a favour to me, Gateway had decided to reduce the price of mine a couple of days early.
Dominic Farmer
74214.16@compuserve.com

PCW replies: Regular readers will have followed the correspondence about Gateway over the last few months. Despite the company's strenuous efforts to convince journalists that all is now well, the complaints we continue to receive suggest that it still has some way to go.

AOL? Are you sure?

I was surprised and disappointed to learn of your choice of AOL for an online readership discussion area.

Surely a forum on CompuServe would have been the better choice? From what I've seen of AOL it's run by juveniles for juveniles — cool and funky, but hardly the place for a respected, and serious, British PC magazine.

You have only to consult your own Letters page to see the proportion of your readership which already has CompuServe accounts. I don't recall us readers having been consulted on the matter, which is a pity because I'm sure the majority would have chosen CompuServe.

For one thing, most people are unable to afford two online providers, and as six other British magazines already have a forum on CIS, you've put yourself a bit out on a limb.

I wish you luck with the venture but I regret that I shall not be seeing you on AOL. Nor, I suspect, will many other readers.
Eric Howgate
100407.2431@compuserve.com

AOL — the sure thing!

I thought CompuServe was probably as fast as I could get when it came to online services and Web access with my 14.4Kb modem. Then I tried AOL. "Wow!" is hardly adequate to sum up what I think of it.

The first time I tried it I was stunned at the speed and ease of the Web access — I can now check my favourite Web pages within a minute. It used to take at least five minutes to get to one page with CompuServe. I also like being able to log on in under 30 seconds — it takes over five minutes with CompuServe.

Well done, AOL. I cancelled my subscription to CompuServe within six hours of installing AOL and do not regret the decision. I also like having access to my favourite magazine just by using the keyword PCWORLD.
Simon Ward
SimonJward@aol.com

Blue over Indigo

The staff at Indigo, my server, seem surprised that I should want to write offline. I sent them a request to tell me how to write letters offline and mail them at a time when Telecom was charging a more acceptable rate.

By way of a reply, I received a full page of "first you do this, then that, and then add this…" and on it went. Their excuse was that the program had to be tweaked because email was not designed to be written offline.

These people live in Dublin where cheap calls are commonplace: I live 230 miles from Dublin and it's a trunk call most of the time.

I fail to see why it should be unusual to want to write offline and post at those times when Telecom is being less greedy and Telecom Eirean is extremely greedy. Surely it is a simple enough thing to do. Then, when it's cheap to send, go back in and "Send all queued mail".

Perhaps Telecom is giving backhanders to make sure we are all being duped into parting with as much money as possible?
John Slainte
eaglejr@indigo.ie

Dutch treat

I recently purchased a Hewlett-Packard Vectra and was astonished to find that when I needed help, I had to call a number in Amsterdam, which cost 45p a minute.

In an economy where free 0800 numbers are commonplace, this is the last thing I would expect, especially from a large, reputable company such as Hewlett-Packard. How any company can get away with having a technical support line which is effectively an 0891 number is beyond me and shows a distinct lack of value for its customers.
Andy Brook
Andy.Brook@ooh.dircon.co.uk

Taking stock of the deliveries dilemma

I was surprised to read that you condone an unprofessional approach to deliveries by some PC and peripherals companies (PCW replies to BN Whitely, Letters, May).There is absolutely no excuse for goods being "out of stock".

Firstly, it is unethical (if not illegal) to advertise goods for sale when they are out of stock. Secondly, the customer should be made aware of such situations at the time they place the order.

In my business (selling hotels abroad) I would be in

Leader reader comment

In the doghouse
I am compelled to respond to Ben Tisdall's Editorial (PCW, April). It is crystal clear that the old days of "trade" magazines maintaining a properly doffed cap towards the establishment has long gone.

This is, in itself, most welcome as I am unfortunately old enough to remember having bought a costly (and non-functional) memory upgrade to my VIC-20 on the basis of an "Editorial" in the PC press.

However, what I find instead, in your own Editorial, is equally unwelcome: an opinion-forming pendulum that has swung totally in quite the opposite direction and which is therefore just as lacking in balance as its notorious forebears.

It demonstrates a regard to facts which can most kindly be described as scant, and a logic which defies rational analysis.

May I provide an example or two from your own text with my commentary to illustrate this?

1. "Aggressive pricing and marketing of MS Office helped it to over 80 percent of the suite market."

Shock, horror, gasp! What should they have done instead? Perhaps set up a BBS, offered it as shareware and given 75 percent of the profits to Battersea Dogs' Home?

You redeem yourself only marginally by the use of the word "helped". In fact, it is very largely the sheer quality of MS Office that has brought it over 80 percent of the market.

2. "It's common knowledge that the US companies Dell and Gateway can buy Office to bundle for less than $80, while the UK manufacturers pay around £140, well over twice as much."

"Patriotism is the last refuge of a scoundrel" said Dr Johnson in the days before even young William was a twinkle in Mrs Gates' eye.

Perhaps the real reason lies elsewhere? I say this as a proud British patriot and adoptive mother of three cats: go out and buy 10,000 tins of Kit-e-Kat. Then go out and buy five million. At such volumes even the most inept negotiator should be able to get a discount which brings the supplier rather closer to what he (the supplier) perceives as his marginal cost. A half-reasonable negotiator might even be able get 50 percent in such circumstances. Gateway can afford to pay good negotiators, even in these days of mad cow disease.

More balance and recognition of all the facts, and less appeal to what you may think your readers want to hear, if you would, Mr Tisdall.
Keith Miller
Luanda, Angola

A bad case of brainwashing
I was quite amused by your Editorial (PCW, April). I think that you, your fellow editors and your contributors have only yourselves to blame for the Microsoft situation.

It was quite clear several years ago that allowing Microsoft to become so dominant would have the result of which you are complaining.

Rarely, however, have you or any other magazine given OS/2 the support that it deserves, or made it clear to readers that there was an alternative operating system. I know the stock answer — you only respond to reader demand.

The present mad rush to upgrade to the latest version of that software, with all the attendant hardware upgrades it needs to perform even moderately well, is an example of the way that almost everyone in the industry has been brainwashed.
John Lewis
Bournemouth, Dorset

A crash course in the benefits of email
May's Editorial was excellent. I hope you mailed a copy to Janet Street-Porter.

As you can see, below, I work in a University. I am sure the whole system would now crash without email, as everybody relies on it as the main form of communication.

We have only just implemented it for our students but already it has become the lifeline of communication. This, together with resources such as course materials on the internal part of our Web pages, sees a whole shift to electronic communication and information.
Richard Eskins
r.eskins@mmu.ac.uk
Dept of Library &
Information Studies,
Manchester Metropolitan University

deep trouble if my clients arrived at their destination only to find that the room they had booked had been sold to someone else.

Like your correspondent, BN Whiteley, my office is responsible for purchasing various supplies for the rest of the company. In my experience, the computer industry is the most unreliable when it comes to deliveries. Once I even lost money when a company, who advertised in *PCW*, went bust before delivering part of my order.

I have now adopted a strict practice: I do not re-order from any company that has let me down, even in a very minor or trivial way.
Joseph M Farrugia
JoeF@harlon.demon.co.uk

Drawing conclusions

Just a quick point about your review of Micrografx Windows Draw 4.0 *(Group Test, PCW April)*. Firstly, the group test summary features table indicated that Draw 4 can't handle multiple pages (drawing files) open in the application (that is, MDI style). Well, that's not accurate. It can.

Secondly, if by the use of the
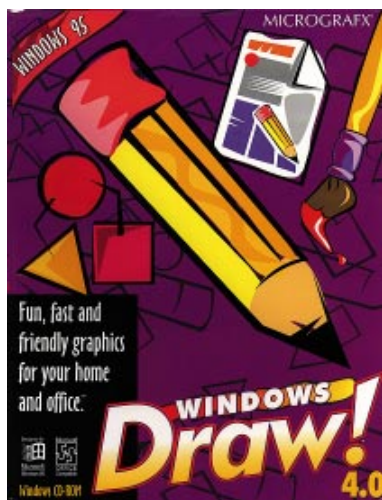
category "Convert text to paths" in the table it was implied that Draw can't convert text to drawn objects (curves) — wrong again. It can do that, too.

While mentioning (incorrectly) those two bad points, the article missed Draw 4.0's biggest problem — OLE. If a drawn object is cut and pasted into another application (such as Word) it gets displayed and printed as a raggy bitmap! So much for its claimed Office compatibility.
Graham Smith
100125.1730@
compuserve.com

The curious world of written quotations

The advice offered in your *Buyer's Charter*: "On large orders obtain a written quotation", is no doubt sound. I wonder if you have tried to follow it in practice?

I offer my recent experience in purchasing a new system, when I decided to play it by the book. Faxed requests for written quotations went out to a short list of four companies: "Goaway" (Gateway 2000), "Dull" (Dell), "Big Len" (Viglen) and "The Computer Man" (Dan).

Big Len responded almost by return; unfortunately he did not read my specification at all carefully, offering a system that was over-specified (32Mb of RAM instead of the 16Mb requested) and way over my budget. He didn't mention the size of monitor being offered.

I asked Len to revise the quotation but got no response. When I telephoned, Len said: "If you can't afford what we offered, we'll send you a price list and you can work it out for yourself." I did receive two copies of the price list but did not feel like a valued potential customer.

Dull didn't respond to the fax but I felt I owed the suppliers of my existing system a second chance — after all, it had given me over three years of trouble-free use. I telephoned and quickly ended up talking to a charming lady in Ireland who had all my details on her system and promised to send the quotation out immediately. The Irish Sea must have been unusually choppy, however, because several weeks later it has not arrived.

My feelings towards Goaway were less charitable, because of what I had read about its customer service in your magazine. I never heard anything from them and dropped them from my list.

The Computer Man's response took several days to arrive but was exemplary: it spelled out all the components offered, even the options I had asked for. The price was reasonable, so making the decision was what the Americans call a "no-brainer". I placed the order, the system arrived when promised and, although it's early days yet, it seems to work fine.

I do find it surprising that leading industry suppliers can afford to toss away an order for over £2,000 so casually. Perhaps I should have expected no better in today's intensely competitive market.
Julian Morgan
wmethod@cix.compulink.co.uk ▣

Nokia 9000 Communicator

There are many who believe that personal digital assistants, PDAs, are the way forward. One look at Nokia's 9000 communicator will have everyone convinced. On the one hand it's a conventional modern organiser with address books, diaries and simple office applications. On the other hand it's a digital GSM mobile telephone, based on the popular Nokia 2110, capable of sending and receiving computer data on the move at 9600bps. Put them both together with some cunning software and you've got a PDA with email, fax and, most impressive of all, Internet Web browsing facilities. Quite easily the most exciting 397g we've seen for ages. For a full review see page 56.
Price £1,350 (expect it to be less than £1,000 with a line)
Contact Nokia 09 9000 2110

Apple MessagePad 130

Apple's MessagePad 130 is the latest in its line of handwriting recognising PDAs. Based around the current Newton 2.0 operating system, the big new and thoroughly welcome feature of the 130 is its user-controllable backlit display. It is possible to communicate with other MessagePads using the built-in infra-red port, or to send email and faxes using an optional GSM digital mobile phone such as the Nokia 2110 pictured here.
Price £549. **Contact** Apple 0800 127753

Toshiba TF 461

Multifunction devices are all the rage, and why not? Fax machines can double up as scanners and printers, so it makes sense to combine all three in a single computer peripheral. The latest to land at *PCW* is Toshiba's TF 461, a colour inkjet, greyscale scanner and fax machine all-in-one for £649. You'll need additional software to fax from your PC, though — Toshiba recommends Delrina's WinFax Pro for an extra £99. Full review of the TF 461 next month.
Contact Toshiba 01932 825052
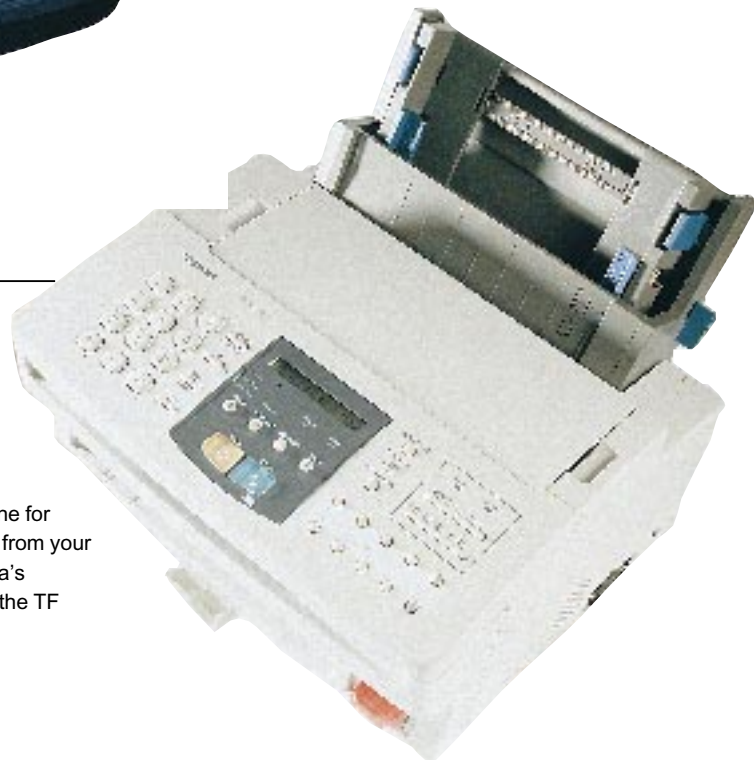
Dual LCD-PC

Best known for its notebooks, Dual Technology has released its interpretation of the all-in-one PC. The LCD-PC boasts a 12.1in SVGA TFT LCD screen rather than the usual tube-based monitor, allowing the designers to create a smaller, less power-hungry box. £1,699 (excluding VAT) gets you the following configuration: Pentium 75, 8Mb RAM, 1Gb hard disk, six-speed CD-ROM drive, SoundBlaster 16 compatible card and a pair of ear-like powered speakers.
Contact Dual Technology 01223 576622

Bosch CompactVision

Those who feel naked without their office-bound video conferencing systems should take a look at Bosch Telecom's CompactVision. Claiming to be the UK's first high-quality ISDN portable video conferencing system, the CompactVision boasts a 6in LCD colour display, integral handset and directory dialling capability. The CompactVision supports 128Kbit/sec via two ISDN B-channels or 64Kbit/sec via one channel. The unit itself costs £2,990 and you can plug it in to your PC, using its RS232 port. Options for larger screens and multiple ISDN connections, for faster link-up, are also available.
Contact Bosch Telecom 01895 834466
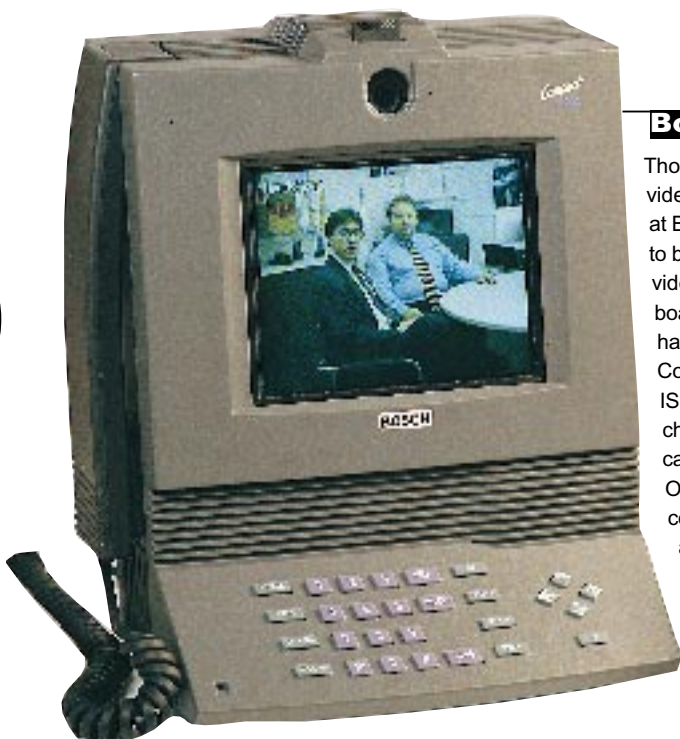
Nakamichi SP-3d

In the world of high-fidelity, Nakamichi is a highly respected name. In recent years the company has entered the computer market with particularly innovative CD-ROM changers. Featured this month are its new powered multimedia speakers. The SP-3d speaker system uses the cunning trick of leaving the largely non-directional deep bass sounds to a single sub-woofer unit. Pop this out the way, and leave the medium-to-high frequency stereo work to a pair of small, magnetically-shielded satellite units. You can attach these to the side of your monitor or sit them on their adjustable stands. Available in black or white from around £120, they'll significantly enhance your multimedia experience.
Contact AGP Distribution 01264 336991

Gadgets *PCW Gadget Photography by David Whyte*

First Impressions

Get that wallpaper right with 3D Home Designer. Get Net-wise with new versions of Navigator and Explorer, and Borland's C++ 5 is the latest thing for Windows developers. Hype-up your editing skills with VideoCraft 3.0. Two pairs of printers go head to head: two inkjets and two big colour lasers.

Contents

VNU European Labs

VNU Labs tests cover every kind of hardware and software including PC hardware, printers, network products, modems and software applications. The tests are continually developed and enhanced to reflect hardware and software developments.

Our tests closely simulate real-world use. For example, our suite of PC benchtests uses complete versions of industry-standard Windows 95 applications — currently Word, Excel, WordPerfect and FoxPro. We also run a graphics re-draw test using CorelDraw 6, and a Doom 2 frame rate test which is a good indication of games performance.

Application tests are the backbone of all the VNU Labs system evaluations but it's nearly impossible to pin an application result to a specific machine component. Only system-level tests (also known as low-level tests) can reliably tell the difference. VNU Labs' system-level test suite is called Euromark. The tests, which are mainly Windows-based, are used to isolate specific components like hard disks, graphics cards and CD-ROM drives.

● To make them easy to read at a glance, all graphs in *PCW* are drawn so that the bigger the bar, the better the result. Normally we'll also include the original data we worked from: for example, the time in minutes and seconds to print a page in a comparative test of printers.

HARDWARE

Nokia Communicator 9000

An impressive, multi-functional, communication combo.

The Nokia 9000 is a combination of mobile phone, mobile email device, portable access terminal and personal organiser. If email is as important to you as being able to receive a voice call, then this is the mobile phone for you.

The device is based on the Nokia 2110 GSM mobile phone and has up to 200 memories depending on the capacity of the small smart card SIMM fitted. In the UK your SIMM is likely to be from Cellnet, which is working closely with Nokia.

On the phone side, there's a full keypad with two function keys, a good screen showing battery and signal strength and a full range of features including the ability to send and receive SMS short text messages. The lithium ion battery gives a standard 30 hours on standby and two hours talk-time, although in the case of the communicator 9000, "talk" could mean computer data or facsimile.

Inside, there's an Intel 386 running at 24MHz, and 8Mb RAM — 4Mb for the operating system and applications, 2Mb for program execution and 2Mb for user data storage. There is no additional storage. The IRDA-compatible infra-red port can beam information to another computer or a printer.

The 9000 is bulky by most mobile phone standards at 174 x 65 x 36mm and tipping the scales at 397g — around twice the weight of most upmarket phones.

The main LCD screen is not backlit but has a resolution of 640 x 200 pixels in eight grey levels. It measures 115 x 35 mm and is surrounded by four soft buttons on the right and two scroll buttons on the left. These are supplemented by nine application buttons including one labelled "Internet" and a help key which gives access to the context-sensitive help. The 55-key Qwerty keyboard is remarkably usable.

Software runs to an address book, calendar and note editor (ASCII only), to-do list, calculator and world clock. There is no spreadsheet (expect that from a third-party company) and no pen input — a design decision made after Apple had launched the Newton.

Sensibly, the Communicator 9000 can be used as a speaker-phone — handy, since when you're using the organiser to check a time for a meeting you can't hold the device to your ear. The musical composer program allows you to compose your own tune, which will play in place of a ring.

The computer keeps track of your phone calls and of course the contacts program can be used to manage the phone memories but it is the greater levels of integration which are most impressive.

Anything you type using the notepad program can be faxed directly from the phone. You can use the device as a mobile terminal to log into computer systems, although this is a little limited by the GSM speed of 9,600bps. A system which uses an inbox and outbox allows the Communicator to control when the data is sent, so you don't need to have a signal to use email. Unlike H-P's OmniGo 700 there is no cc:Mail client software or built-in programming language but Nokia is promising a comprehensive developer support programme.

The most spectacular piece of software is the World Wide Web browser. The Web is a great way to look up information — a kind of electronic Yellow Pages for the whole world, and with the Nokia 9000 you can carry this in your pocket.

The standards for Web software are changing all the time as new techniques are developed. The communicator has the ability to download upgrades into its flash memory but Nokia is being exceptionally secretive about work which is going on in conjunction with Sun Microsystems.

Thanks to the GSM specification you can send and receive mail, faxes and SMS messages pretty much anywhere in Europe — although in some places the data facilities are still a little crude. The unit is supplied with PC backup software and an RS-232 cable and there is a comprehensive range of accessories including a hands-free car kit.

This is the most exciting device we've seen in a long time. It won't be available until the middle of August but despite the high price tag there are already people counting down the days.

Simon Rockman

PCW *Verdict*

Price £1,350 (expect it to be less than £1,000 with a line)

Contact Nokia 09 9000 2110

Good Points It does everything.
Bad Points It costs more than a Pentium PC.
Conclusion Anytime, anyplace, anywhere; you can be online.

Navigator 3.0 *vs* Internet Explorer 3.0

Close combat between the two leading Web browsers.

Microsoft and Netscape have both gone into beta on version 3.0 of their browsers. We do not normally publish beta software tests but in this case anyone with Internet access can download and try them for themselves.

Navigator is beginning to resemble Quark XPress' way of thinking. What made XPress so successful in DTP was the XTension technology which could

Above *Navigator's email support remains unsurpassed and makes good use of frames*
Right *Explorer 3.0 will take full advantage of VB Script to enhance Web pages with mouse hot spots*

turn a basic DTP tool into something far richer. By encouraging and supporting third-party plug-ins, Netscape seems to be doing the same.

Stung by Internet Explorer 2's support for inline video (.avi) and sound (.wav and midi), Navigator 3.0 now supports .avi files, but only through a plug-in — not HTML. Internet Explorer (IE) 2.0, supported video and sound in the form of simple HTML tags, such as <BGSOUND src="*.*.wav">. The simplicity of adding sound and video to Web pages in this way gave IE 2.0 a significant edge over Netscape. It still has it with version 3.0. Why use Java when a simple tag will do? Navigator still cannot match other simple tags such as <scroll> tag, but it does now allow background colours in table cells.

A definite trend is now emerging.

Microsoft has decided that the browser should be fully integrated with the OS (Windows 95, NT 4.0) and all multimedia extensions built into it. Netscape is happy to let third parties develop plug-ins which it then chooses to support. The extent of such plug-ins means that Navigator is fully functional: witness the new CoolTalk plug-in which allows data conferencing in Navigator 3.0. But this has a cost: already Navigator takes nearly 3Mb of hard disk space. The program group, with only three plug-ins, takes 11.7Mb. So the trend is set. By comparison, the IE 3.0 executable file is still only 743Kb.

There are some things that Netscape will never be able to do such as exploit right clicks to save gifs as wallpaper, or paste active IE shortcuts into word documents and email. But, of course, you need Windows 95, too.

IE 3.0 fails miserably when it comes to moving beyond the Web. Netscape has the finest integration of mail, newsgroup and Telnet access: so good, you need never leave the browser. Not so with IE 3.0 which relies still on clumsy interaction with MS Exchange and its Telnet application.

The Gold version of Navigator lets you edit Web pages within the browser but is unintuitive and inaccurate. Explorer 3.0 has a new Edit button which works in conjunction with Internet Assistant for Word but is equally confusing to use.

Both approaches need work.

Navigator 3.0 still can't match IE 2.0's inline TrueType font support and Microsoft is busy extending this in version 3.0. Netscape fans may scoff: "Alright, so IE can do fonts but it can't do frames, or Java, or ShockWave or Amber." Well, sorry, it can now.

Thanks to Microsoft's new ActiveX technology (an extension of OLE) Explorer 3.0 can do everything Navigator can and more. Although Microsoft has licensed Java and JavaScript it is busy promoting VB Script (based around its own Visual Basic) to extend Explorer further. VB Script will enable more functionality to be built-in to Explorer: for example, mouse hot spots which work like balloon help on Web pages.

It's hard to make definitive comparisons of efficiency due to variances in bandwidth, but downloading an HTML file from a local server took 10.56 seconds in Explorer and 8.65 in Navigator. Beta against beta perhaps but it confirms that IE still suffers a speed problem compared with Netscape.

So which is better? — Navigator. Just. But as long as both vendors keep leapfrogging each other with such a vengeance it will be a long time before either opens up clear blue water. It remains a fascinating battle to watch.

PJ Fisher

PCW*Verdict*

Netscape Navigator 3.0
Price n/a
Contact http://www.netscape.com

Good Points Frames. Superb mail and newsgroup access.
Bad Points Relies on plug-ins for simple tasks and is in danger of becoming flabby.
Conclusion Still the world's best browser for all platforms but its lead has shortened.

Microsoft Internet Explorer 3.0
Price n/a
Contact http://www.microsoft.com/ie

Good Points Fonts support. Easy multimedia support in HTML. Works well with Win95.
Bad Points Still too slow.
Conclusion If you use Windows 95, this browser makes perfect sense.

Hardware

Citizen Printiva 600c *vs* Canon BJC-4100

Two inkjet printers: one glitzy and glamourous, the other more down-to-earth.

The colour inkjet is currently the most popular printer on the market. For a reasonable price you can snap up a printer that offers good quality output and will be reasonably cheap to maintain.

Both the Citizen and Canon printers come in at around the same price but are very different in terms of ease of use and print quality. The most fundamental difference between the two is in the print technologies they use.

The Citizen has a series of tape-like cartridges (a dry ink system). Four cartridges allow proper CMYK printing, or you can swap to metallic ink cartridges to add a bit of spice to your documents. The cartridges simply snap into place in the lid of the printer and lift easily in and out. Since the ink is dry there is never any danger of getting your fingers dirty.

The Canon has only one cartridge and prints using bubblejet technology. The colour cartridge contains cyan, magenta and yellow ink — black is made by mixing these three. When the colour cartridge is swapped for a dedicated black one, black text printing is condiserably improved. This is reasonably easy, but not quite as flexible as the Citizen's arrangement.

Both printers were easy to set up under Windows 95. The colours produced were outstandingly vibrant and rich. We have two particular favourite images that we like to benchmark: one is fruit and the other is a backdrop advertising a combat game. The sharpness and accuracy of the Canon was very good and the colour

Canon was automatically sensed by Windows on boot-up and the installation process was complete before Windows was fully launched.

Once installed, the controls for each are entirely software-based. The Citizen has a slightly more complicated yet more sophisticated set-up which allows greater flexibility in the way you print. This is due mainly to the presence of four cartridges which allow you to print in a greater variety of ways than the Canon.

The Canon has a more user-friendly interface. It allows you to adjust your print requirements for a dozen different paper types; the quality of print you want; and the resolution. It is also intelligent enough to know when you are asking the printer to do impossible things. If you set too high a grade of printing on, say, standard paper then a window will pop up and offer to fix the problem for you.

Each handles the physical printing process in a very different way. The Citizen does a four-pass shuffle, putting down one colour in turn: the single head shifts over and takes each of the colours in turn; the result being that full-colour printing takes some time. In comparison, the Canon fairly zips away as it needs only one pass for all three inks.

The quality of the output reflects the different technologies. The Citizen produced clear, sharp images. But even at 600 x 600dpi, the black type had tiny pinpricks of white in it where the ink had not taken properly (even on high quality paper). The Canon, however, had much better type at its maximum resolution of 360 x 360dpi for the same quality paper. But when using a colour cartridge instead of dedicated black, the ink appeared a muddy grey.

However, it was when printing in colour that the Canon indisputably held the upper hand. The colours produced were outstandingly vibrant and rich. We have two particular favourite images that we like to benchmark: one is fruit and the other is a backdrop advertising a combat game. The sharpness and accuracy of the Canon was very good and the colour

matching was truly excellent.

Sadly, the output from the Citizen looked jaded in comparison. None of the colours were particularly bright and the overall effect of the printed images was dull in comparison to the Canon — even the fruit looked unappetising. However, the trump card in the Citizen's favour had to be the metallic ink. The gold was stunning and the metallic magenta was frivolous — it's the kind of colour of which children are fond but you'll soon grow out of it. Surprisingly, the black cartridge was probably the best of the lot, creating good solid monochrome images.

Overall, despite the Citizen's flash and sophistication, it was the more conventional and cheaper Canon that won the day. For text and colour images it definitely held the trump card.

Adele Dyer

PCW *Verdict*

Citizen Printiva 600c
Price £399 (street)
Contact Citizen 01753 584111

Good Points Cartridges are easy to change. Metallic ink.
Bad Points Dull colours.
Conclusion Adaptable, but not outstanding.

Canon BJC-4100
Price £300 (street)
Contact Canon 0121 680 8062

Good Points Great colour
Bad Points You need to change cartridges to get a dedicated black.
Conclusion A splendid printer

SOFTWARE

Corel Graphics Pack

Even good value and varied utilities can't compensate for the lack of integration in this package.

The CorelDraw Suite has dominated the PC professional graphics market for years but it has gradually become too complex and expensive to attract those all-important new users. Recognising this, and the competition from other players like Windows Draw, Corel has brought out a new mid-level suite called Corel Graphics Pack. This does not mean that it is a cut-down product. The program arrives on five CDs and even the minimum install will eat up over 80Mb of your hard disk.

For your money you get two main drawing applications: Corel Print House and Corel Flow, a bitmap editor, PhotoPaint and various other utility programs. Connecting them together is the Corel Graphics Pack Wizard. This is a task-driven interface that allows the user to choose what they want to do (painting or producing a family tree for example) and then loads the best-suited program. If you choose to produce a graphic design, for instance, the central Print House program is loaded and further options are offered for producing banners, brochures and so on, along with the overall approach; whether classic, casual or creative.

For projects such as calendars or certificates, this could well be all you have to do but for most work this is only the beginning. Although some features of the Print House interface such as the toolbox are reminiscent of Draw, this is very much a new program. In particular, down the left-hand third of the screen is the Notebook. This can be used for conveniently selecting clipart and colouring styles but it normally displays help. This is of the most basic "how-to-change-things" variety, which has its place for the absolute beginner but will

Above *The Graphics Pack Wizard attempts to lend an integrated feel to the package*
Left *Corel Flow is a powerful diagramming program*

soon irritate the experienced user — that is, if you ever become an experienced user. The whole philosophy behind Print House is that you should not expect to spend too

much time on it: just make a few choices and print out the result. In fact, this is probably a good idea as the limitations of the package, in text handling and formatting for example, soon become apparent. For bolting together a quick design, Print House has its place but it should certainly not be the centrepiece of a graphics suite.

Corel is, presumably, aware of the limitations, so for more serious design work it offers Corel Flow. This is another drawing program but aimed at the production of diagrams such as flow charts and room plans. Objects are dragged onto the screen from a floating palette, then linked with different line types. If the shapes are then moved, their connector lines move with them, automatically

avoiding existing objects.

The power is impressive but for the majority of mid-range users, too intimidating.

Between the over-simple Print House and the over-technical Flow, Corel has pulled off the difficult trick of completely missing the central ground of basic drawing. For bitmap editing, Corel has taken the easy option of bundling its full PhotoPaint program. This is a dedicated, standalone, application that offers just about everything from scanning to artistic special effects. It might seem harsh to complain about too much power but the emphasis on advanced features such as masking, merging and object handling actually detracts from the basics offered by PhotoPaint.

By this stage it's become pretty clear that Corel Graphics Pack is not a united graphics solution. The half-hearted attempt at integration via the central Wizard and task-based approach soon collapses between such different applications. At best, Corel Graphics Pack is a mixed bag. Looking at it as just a collection of programs, what else do you get for your money?

Corel Presents is a reasonable PowerPoint clone for creating business presentations; Corel Depth allows simple text and graphics to be given a 3D effect; Corel Motion is a very basic animation tool; Corel Capture is a screenshot utility and Corel Multimedia Manager is a cataloguing system for controlling the vast collection of clipart. Finally, and for little apparent reason, there is a collection of basic Internet utilities.

With so much included in the price, there is no question that Corel Graphics Pack is good value. But unfortunately that's not good enough. The sheer quantity, variable quality and lack of consistency and integration across the package affects its usability throughout. When the essential drawing power is not there either, the result is a bit of a mess.

Tom Arah

PCW *Verdict*

Price £99
Contact Channel Marketmakers 01703 814142

Good Points Value for money.
Bad Points Unfocused and poorly integrated. No central drawing program. Kitchen sink philosophy.
Conclusion A missed opportunity.

Borland C++ 5.0

Windows developers and Java junkies, take note.

The majority of shrink-wrap applications are written in C or C++, the native language of Windows and the best choice for performance and flexibility. Once the market leader, Borland's C++ lost ground to Microsoft's Visual C++, a product which has made great strides in terms of usability and features. Borland C++ 5.0 now answers back with several advantages for

Above *Visual Database tools give a quick start to database dialogues*
Right *We do Java: support includes syntax highlighting and a basic Java debugger*
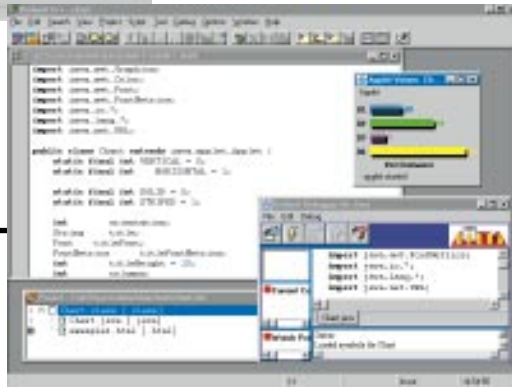
Windows developers.

The first of these is support for different Windows versions. Developers using Microsoft tools need to run two versions of Visual C++ to support Windows 3.1, Windows 95 and NT. Borland C++ 5.0 requires Windows 95 or NT to run but targets DOS, 16- and 32-bit Windows from a single, integrated, development environment (IDE). It's not the first compiler to accomplish this trick since Watcom's C++ does all that and OS/2 as well. But few developers are willing to put up with Watcom's crude IDE for the sake of its cross-platform tricks. By contrast, Borland C++ 5.0 combines a sophisticated IDE with a rich bundle of tools.

New in this version is ObjectScripting: a way of automating the development environment. For this, Borland has created a new language. An interpreted language based on C++, cScript is reminiscent of Java in that awkward features of C++ are omitted. There are no pointers, variables are un-typed, and cScript uses strings rather than character arrays. The language supports inheritance, can call DLL functions and is an OLE automation client. Since the Borland 5.0 IDE is exposed as a cScript object, the possibilities for customisation go well beyond the competition's.

Borland C++ 5.0 supports VBX (Visual Basic Extension) controls for both 16-bit and 32-bit applications. VBX controls are commonplace and not all have been converted to the OCX format that Microsoft now prefers. Most other development products, including Visual C++ and Visual Basic cannot use VBX controls in 32-bit applications. Borland C++ 5.0 gives you VBX

support both in code and in the visual dialogue editor, even hacking the version 3.0 data-aware VBX format so that controls can be hooked to database tables for automatic data display. This feature uses the Borland Database Engine and simple database applications can be built, visually, in the dialogue editor. OCX controls are supported, too, but only in code. You cannot load OCXs into the dialogue editor and there is no easy way to create an OCX since Borland has not licensed Microsoft's OCX development kit.

A modern C++ product is really several products in one. There is a compiler engine, C++ editing tools and a

class library which simplifies programming, especially the complexities of the Windows API. Borland has its own class library (ObjectWindows, or OWL) now at version 5.0 with new classes to support the Windows 95 common controls. Borland supplies 16-bit versions of most Windows 95 controls, too, excluding the rich text control for added cross-Windows compatibility.

OWL is technically excellent with a better object model than Microsoft's Foundation Classes (MFC). But MFC is the industry-standard and some prefer its thinner wrap over the Windows API. Borland 5.0 does not include MFC, but will compile it, up to a point. The problem is that MFC has to be patched for Borland's compiler and the patches are specific to particular MFC releases: in this case, the versions supplied with Visual C++ 2.0 and 4.0. So there's no support for 16-bit MFC and future versions will need additional patches. Borland's MFC support is for occasional use only.

Borland is hitching up to the Java bandwagon. Sun's Java Development Kit is bundled and the Borland IDE can handle Java code, complete with syntax highlighting and a simple Java debugger. This is, itself, written in Java which accounts for its lethargic performance. It's early days for Java tools and although the integrated support is rudimentary, this is better than nothing.

Borland C++ 5.0 now comes with the database engine and visual database tools as standard. The premium Development Suite bundle adds Codeguard, a debugging tool for catching memory leaks and other intransigent errors, the PVCS version control manager, InstallShield Express for creating install programs, and a just-in-time Java compiler for dramatic speed-up of Java code. This Java AppAccelerator is great but it's not distributable, which limits its usefulness.

Tim Anderson

PCW *Verdict*

Price £225; Borland C++ Development Suite 5.0 £315
Contact Borland 01734 320022

Good Points Cross-Windows compatibility. Visual database tools. Java support.
Bad Points No help with OCX development. Hassles with MFC.
Conclusion Enough to keep Borland developers in the fold.

Quarterdeck HiJaak 95

Allows you to create thumbnail icons of almost any picture format — one less reason to be jealous of Mac users.

A long time ago, Adobe provided Photoshop for the Macintosh with the facility to create thumbnail previews for graphics files, then use them as the icons for the files themselves. When browsing through windows, you could see straight away what the file was from its thumbnail icon.

When Windows 95 arrived, one of my first questions was whether it could do the same, either as a built-in facility or one developed by a third party. Microsoft stated it would not, blaming the lack of suitable resource forks in the DOS FAT file system. During the lengthy Beta test period, some consolation was found in the Quick View option when right-clicking a file.

Almost all graphics file formats could be opened with Quick View and displayed at a decent size. The only trouble was that this could be quite time consuming, depending on the file size. While these were much bigger and clearer than the Mac thumbnail previews, they just didn't offer the same instant identification. Worse still, Quick View for graphics files was removed for the final release of Windows 95 and popped into the optional Plus Pack.

Last September Quarterdeck acquired Inset Systems, developers of HiJaak, a highly fluent graphics file format converter. The latest version, and first under Quarterdeck's wing, is HiJaak 95 which promises to "extend the Windows 95 shell to enhance, view, convert, capture, print, find and manage all your graphics."

To be fair, HiJaak 95 isn't just a standalone application or utility, but a genuine extension to the Windows 95 shell. A complete installation requires 12Mb after which a new control panel is added, along with an addition to the task tray at the far right end of the task bar, next to the clock.

The complete viewing, conversion and manipulation application can be
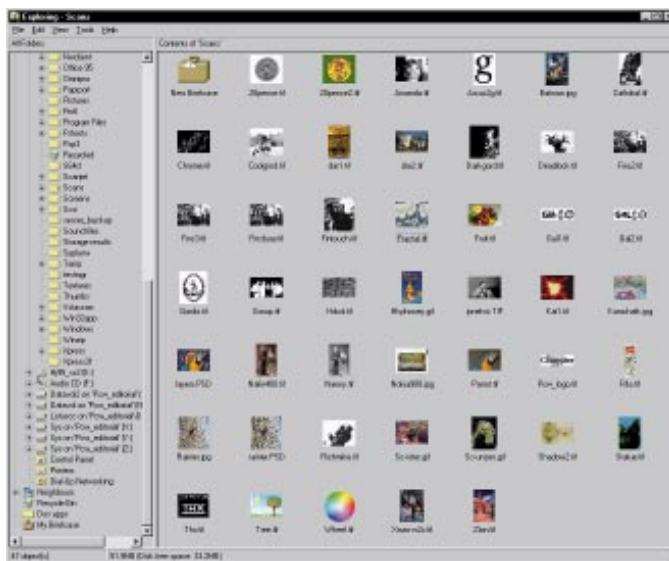
Above *Wow! Mac-style thumbnail icons for graphics files*

Left *HiJaak 95 adds these options to a right mouse-click*

launched by hand, but mostly you'll be accessing the whole thing, or aspects of it, from a right mouse-click. Yes, HiJaak 95 adds six new options to the pop-up menu when you right-click a graphics file, and offers additional functions on the properties.

Most exciting for this writer is the facility to create thumbnail previews of graphics files and use them as their icons, as you would on the Macintosh. HiJaak runs in the background and waits for a new graphic file to be created, at which point it creates a thumbnail preview for the icon. Even on a quick machine this can take some seconds, during which your system slows a lot.

This is reasonable when you first set HiJaak off creating thumbnails for all your graphics files, but later it can prove inconvenient. Fortunately, the new addition in the task tray, which indicates HiJaak's activity, may set the priority of updates. You can also adjust this from the control panel, along with the icon size and the number of colours allowed.

HiJaak View, accessed from a right-click of a graphics file, offers what Quick View always should. It still takes a few seconds to open and display each image but is compatible with virtually every graphics file format, and additionally offers considerable colour adjustment, brightness and resolution. It is also possible to convert from one format to any other within HiJaak View, or even from another right-click option.

Properties of graphics files can now include additional text information describing any aspect you desire. Subsequent searches can then be made, not just on file type, location and size but also any key words you've attached.

HiJaak 95 supports 35 raster bitmap formats, 19 vector formats and 19 fax devices. I threw everything I had at it: HiJaak coped with CorelDraw files (CDR), Macintosh Picts (PCT), Photoshop 3 documents with layers (PSD) and just about every flavour of EPS and TIFF files, including CMYK or LZW compressed TIFFs. It did fall over at the obscure Lab format TIFF and a couple of curious non-standard EPS descriptions but don't hold that against it.

HiJaak 95 does virtually everything you could fairly ask of it, including the remarkably successful and welcome creation of thumbnails for icons. Add compatibility and conversions of almost every graphics file format, along with superb integration with Windows 95 itself, and you've got a winning product.

Gordon Laing

PCW*Verdict*

Price £49.95
Contact Quarterdeck 01245 496699; http://www.qdeck.com

Good Points Creates thumbnail icons, views and converts almost any graphic.
Bad Points Microsoft didn't build it into Windows 95.
Conclusion The Windows 95 utility for which I've been waiting.

NEC MultiSync XV15+

NEC's latest is an excellent performer with a great picture.

Big names such as Sony, Philips and NEC are selling decent monitors at street prices of around £300 for a 15in or £500 for a 17in version. Next month sees our annual monitors group test but as a taster, here's NEC's latest and cheapest 15in model.

The MultiSync XV15+ was forced out of the group test by NEC's forthcoming multimedia M500 15in model, which boasts the company's brand new ChromaClear tube technology. We do know that the M500 will be more expensive than the XV15+, which remains the cheapest NEC 15in monitor at just under £300 on the street.

The V in XV stands for Value, the cheapest of NEC's monitor ranges, set below the mid-range Efficiency, XE, and high-end Professional, XP ranges. The XV15+ is a significant improvement over the earlier XV15, now boasting digital controls and NEC's anti-glare OptiClear surface.

The controls are not on-screen, but cover image size, position and barrel/pincushion adjustment. The case measures 372 x 389 x 414mm and has a viewable image size of 13.8in (35cm).

The horizontal scanning frequency range of 31 to 65KHz is capable of a maximum non-interlaced resolution of 1024 x 768 at 80Hz. NEC recommends running at 75Hz, which is sufficiently high on a 15in monitor to eliminate flicker.

At this resolution the image is extremely sharp, with very fine details perfectly resolved. There are no discernable colour casts or geometric distortions to speak of. All in all, this is an excellent performer.

The XV15+ is supposed to be Windows 95 plug-and-play compliant, but certainly didn't want to reveal its personals to my Number 9 graphics card, which had to be configured manually. The monitor's Intelligent Power Manager did kick in on the appropriate instructions of Windows 95 and my VESA DPMS-compliant card. In this state, the monitor consumes less than 30W. Safety on emissions meets the MPR-II standard.

Gordon Laing

PCW*Verdict*

Price £399 (street price £299)
Contact NEC 0181 993 8111

Good Points Great picture. Cheap price.
Bad Points Plug'n'play not infallible. Good 17s are only £200 more.
Conclusion Excellent 15in at a low price.

VideoCraft 3.0

VideoCraft's Project Editor

Video effects with speedy editing, easily achieved.

VideoCraft is the Windows 95 32-bit re-incarnation of a program originally called PhotoMorph. What started as a simple morphing program was developed to offer so many other video editing features and effects that it rendered the "morph" part of its name misleading. The program has now been renamed.

VideoCraft accepts various types of source material, including most of the popular still image file formats (PCX, BMP, JPEG and so on.) and video files (AVI). It includes a screen capture facility, in case you have an image in a format that VideoCraft can't import.

Once the source material has been loaded into the program, it can be edited. There are tools for cropping, scaling, rotating and correcting colour characteristics as well as basic filter effects for still images. With video files, you can mark in and out points and change sampling options.

After basic editing, special effects can be created. The command centre of VideoCraft is its Project Editor, where the source material is loaded for editing. There are seven groups of effects: Colorise, Distort, Morph, Overlay, Stylise, Transition and Warp (providing over 200 individual effects and more if you include the sub-options). Additionally, up to three effects can be applied simultaneously.

Sequential effects can be chained together using a storyboard. In combination with the video editing options, the Storyboard can be used to perform basic, non-linear, digital video editing. But for this you'd be better off using Video Action; a track-based video editing program included on the second CD-ROM in the VideoCraft pack. It provides lots of example projects to help you get started. Video Action offers sound dubbing to video clips as VideoCraft itself does not handle sound. Included in the pack is a 3D graphics program (Arena Design 3D) and articles on digital video.
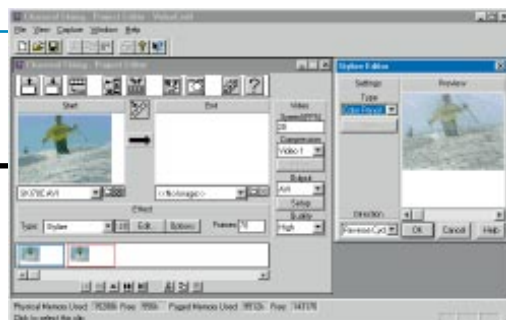
You'll find it hard to find a type of video effect currently in use on TV which VideoCraft can't reproduce. We've included several AVI files demonstrating VideoCraft on this month's free, cover-mounted, CD-ROM.

Panicos Georghiades

PCW*Verdict*

Price £119
Contact LTS 01386 792617

Good Points Easy to use. Relatively fast.
Bad Points Does not handle sound.
Conclusion Provides a rich set of video effects.

Steinberg WaveLab

This new, easy to use, 32-bit audio editor provides quality results.

The frequency graph doesn't just look good; it's invaluable for comparing mixes

WaveLab is the first 32-bit digital audio editor designed for Windows 95 and NT. It is supplied on CD-ROM and, once installed, uses the CD as a copy protection device.

Although WaveLab is geared towards the high end of the market, it's happy to run on any system with 8Mb RAM. Our test machine was a 486 DX50 with 8Mb, running Windows 95.

Surprisingly, WaveLab requires less than 5Mb of hard disk space for installation. Occasionally you will be asked to insert the master CD for verification but after four days of use I've yet to be asked. Running under Windows 95, you're advised to make changes to the virtual memory settings to optimise WaveLabs' performance. It is recommended that you set aside at least 20Mb for the swapfile and a maximum of 40Mb.

At first glance, WaveLab looks no different to any other sound editor. It's only when you import a 36Mb file that it comes into its own. Once the software has built a peak file, the file is loaded before you can say "Phew! that was quick."

WaveLab makes the most of multitasking in a 32-bit environment. While playing a file, you can zoom in or out, perform any operation from copying a section to changing the EQ (equalisation) without noticing a glitch. When the processing has finished you hear the altered wave, not the original. This also applies while looping a section of audio.

Depending on the hard disk space available, you can perform unlimited undos. This is a valuable tool, since you can perform several EQ changes and instantly cross-reference with the original while the file is still playing.

The EQ dialogue box provides high and low shelving filters and a parametric mid-band equaliser with adjustable width (Q). For each processor, WaveLab provides several predetermined settings, or presets. For example, EQ presets include high cut, mid and bass boost. Because of the sheer amount of processing the PC has to do to work out EQ changes, it took over five minutes to complete a three-and-a-half minute song on our test machine. In a post-production setup, where EQ settings are finalised before producing the master CD, a Pentium system with fast disk and at least 16Mb is recommended.
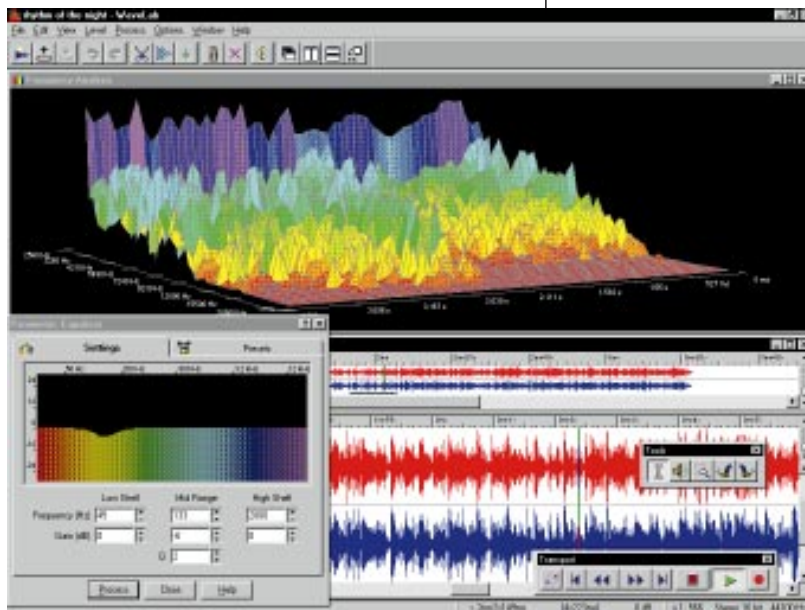
You can view the harmonic content of a file by producing a frequency graph, sometimes known as an FFT (Fast Fourier Transform) plot. You can specify plots for any frequency range, or for the entire audible spectrum: 20Hz to 20KHz. The graph can be viewed from any angle and drawn on either a linear or logarithmic scale, allowing to compare your mixes with any reference material.

Time stretching is another high-end feature on offer. It allows you to stretch or compress the length of a file without changing pitch. You can apply changes by specifying the original and required tempos, or by specifying the new length for the track. Again, time stretching is another highly processor-intensive feature. The results are very accurate and without glitches.

Several effects can be applied to part, or all of the tracks. These include pitch correction to 100th of a semitone, choruses and harmonies. The harmoniser allows you to use up to 16 separate voices and apply pitch, level and pan settings for each. The results, when used subtly, can be quite good with a vocal. Apply a harmony above a third, however, and your track begins to sound like a recent TV advertisement for Levi's jeans.

Batch processing is a new feature in sound editing and a Godsend for many. It allows you to select several files and apply the same processes to them while you make yourself a cup of coffee, or go for lunch. One example would be to normalise and eliminate DC offsets for each track on an album. You first select the files, choose which processes you require, hit run and then leave it unattended. To do this manually might take three or four hours, with regular prompts from the program.

You also get a simple database with the package that scans all media for audio files (WAV and AIFF) and quickly locates them when needed by entering key words. If the file is on a CD-ROM, it prompts you for the correct disc.

Steven Helstrip

PCW*Verdict*

Price £299 (incl VAT)
Contact Harman Audio 0181 207 5050

Good Points Batch processing. Ease of use. Quality results.
Bad Points Certain tasks could be faster.
Conclusion A very capable package that gets any audio job done quickly.

3D Walkthrough Home Designer

The inside story for interior designers.
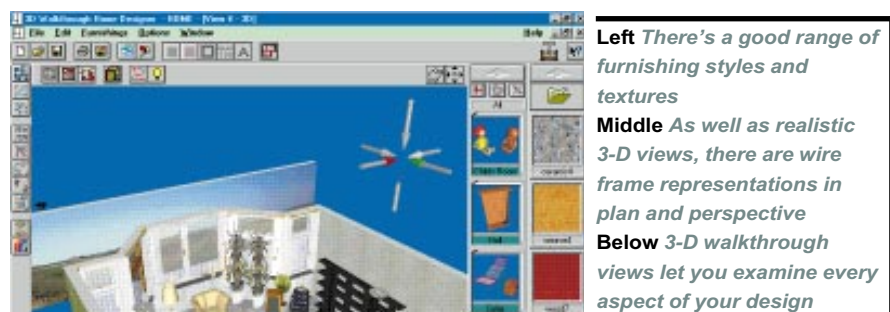
Left *There's a good range of furnishing styles and textures*
Middle *As well as realistic 3-D views, there are wire frame representations in plan and perspective*
Below *3-D walkthrough views let you examine every aspect of your design*

There are now several "home design" programs on offer, based on the premise that you want to see how your furniture would look in a new position or inside a new house. The big drawback is that their programmers' ideas of furnishing style or colour schemes may not be your own. 3D Walkthrough Home Designer goes a long way to solving that problem: firstly, by including a wider range of furniture styles and secondly by letting you apply different texture finishes to almost every item of your decor.

In most other respects, 3D Walkthrough Home Designer is representative of the genre. Instead of moving paper symbols around on a piece of graph paper, you rearrange the furniture (and change the colour scheme) by moving computer graphics around on-screen. To do so, you first need to have laid out your rooms' shapes and sizes so the program lets you do that, constructing your floorplan together with an abstract view of walls, windows, doors and furniture.

The various items of furniture are then selected from a catalogue, claiming to contain over 1,000 objects, and arranged around the room in either 2-D or 3-D views. Moving furniture around is simple because the program automatically detects collisions between objects. You can then add textures to almost everything, using the bitmaps provided or your own scanned fabrics, wallpapers, and so on. The program boasts a special

time to assemble during the basic construction and preliminary viewing operations. Plain, untextured, colours still show approximate decor and are faster. But faster still is wire-frame representation and you can work in this way, too.

In 3-D mode you would expect to be able to view your work from different angles so these can be adjusted almost infinitesimally: both side-to-side and up and down. Two other options increase realism: the first allows you to view from inside your rooms and the second lets you set your angle of view so that it matches your own physical height. Finally, there's the eponymous Walkthrough feature, whereby you can control the direction and position of your view by cursor so as to simulate movement within and between your rooms. But this is a largely irrelevant feature if you haven't got pots of processor power and masses of memory.

A program as powerful as this isn't learned in a day and you'll need to set aside plenty of time to familiarise yourself with it. In this sense, it's not for the casual user.

Such operational criticisms aside, 3D Walkthrough Home Designer is a flexible and potent program for the dedicated designer.

James Taylor

Walk-Through-Mode, too, where you "wander through" your finished design, hopefully getting a realistic impression of the finished layout.

There is a snag, of course. The speed of 3D Walkthrough Home Designer depends to a great degree both on the processor's power and the number of colours displayed. To run properly, 3D Walkthrough Home Designer requires 486 DX2 66 or, better still, a Pentium. Additionally, it wants a minimum of 8Mb RAM, together with either a VESA Local Bus (VLB) or PCI graphics card. Anything less in any of these departments and it runs like treacle.

One way of speeding the program up is to forego textures, which take a long
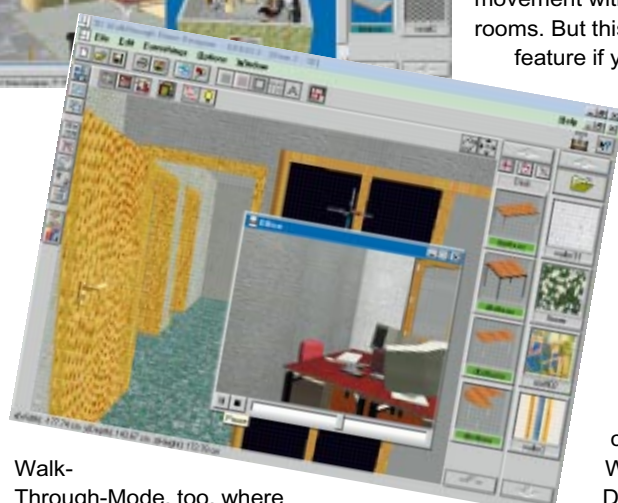
PCW*Verdict*

Price £49.95 (incl VAT)
**Contact** Data Becker UK 01420 22707

Good Points Impressive range of features, especially textures and furniture styles. Low price.
Bad Points Slow. Not at all intuitive. Long learning period required.
Conclusion Not a program for the casual browser, it will nevertheless repay careful familiarisation as a specialist and dedicated tool.

OfficeTalk

A comprehensive PIM software package for workgroups.

OfficeTalk's style — big buttons and red and blue coloured type for the contacts — make it look like something designed for children. But don't be misled, this is a sophisticated Personal Information Manager (PIM) designed for workgroups.

The core feature is the Contact Manager. It has a rich set of contact management features, but isn't over-fussy. Contacts are displayed either by company or by individual. In Company View the contact card is split into two windows. The top window contains address and phone number details for the company; below it are the contacts within that company.

There are fields for all reasonable contact material, including the business and home addresses of individual contacts. OfficeTalk will also dial the phone for you. I would have liked to have seen an automatic timer to record the duration of the phone call and for this,

along with the date, to be automatically inserted in a call log. If you charge by time, this is a Godsend.

Each user can have a personal diary for recording appointments, to-dos, and background activities. The Diary has daily, weekly and monthly views. Colour coding is used to show the status of the task: red shows a task which is overdue and green shows one which has been completed. If you have the appropriate access rights you can view and even update other users' diary information. One especially useful feature is the ability to keep diary information for resources such as meeting rooms, pool cars and other bookable items like overhead projectors, say.

The Where button in Diary mode shows you where other people are, or shows other people where you have gone and when you will be back. It will also tell you whether somebody is in the office and whether they are logged on to
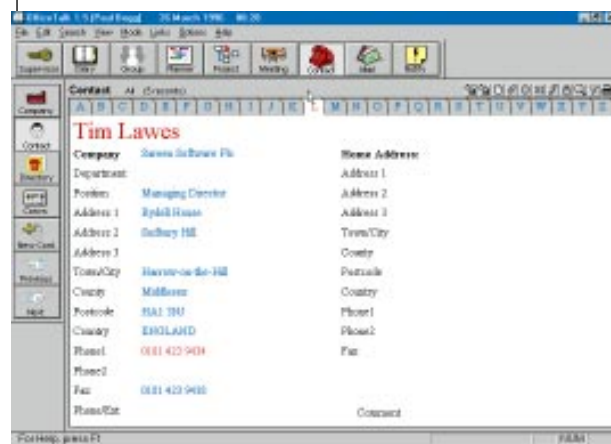
business trips. A workgroup planner can show when all members of the workgroup are committed, or otherwise away from the office. Project mode makes it easier to plan and monitor projects and Meeting mode not only provides an area where you can organise meetings but also check the availability of other users and resources, write meeting agendas, send out meeting invitations and monitor the replies.

Meeting mode works closely with the OfficeTalk mail system. This is an easy to use mail facility with most of the features you would expect from a standalone mail package. OfficeTalk mail is MAPI and VIM compliant (which means it will interface with Microsoft Mail, Lotus cc:Mail and other popular email packages) and can be used to send mail to individuals and groups of users.

OfficeTalk can also be linked to CompuServe, enabling users to send and receive Internet mail directly from OfficeTalk. Windows 95 users can connect to MS Exchange via MAPI and send/receive Internet mail through their service provider. However, there is currently no direct connection between the OfficeTalk and the Internet.

Another useful feature is Working Remote which lets you copy certain portions of the OfficeTalk database onto a local disk and continue using OfficeTalk as if you were connected to a shared database. This is extremely useful if you have a portable computer and spend a lot of time away from the office. I particularly liked OfficeTalk's ability to link to any major word processor to create documents and will archive those documents against the contacts in OfficeTalk's central database.

Overall, OfficeTalk is a powerful, simple-to-use contact manager with the added advantage of being available for workgroups. Despite the minor deficiencies, I liked it a lot and recommend that any workgroup should take a long, hard, look at it.

Paul Begg

Right *OfficeTalk provides two views of contact data: view by company, with contacts within the company…*

Below *…or, by individual contact with both business and home address details*

OfficeTalk or not, or if that person is in a meeting, where it is and when the user is due out. The When button tells you when you booked a particular task or meeting.

Other features include the Planner mode — an electronic wall-planner for scheduling long-term projects, holidays and

PCW*Verdict*

Price £58.75 per user
Contact Sareen Software 0181 423 9434

Good Points Easy to use but powerful and with good workgroup features.
Bad Points Doesn't automatically record contacts such as phone calls.
Conclusion A nice PIM. Well worth taking a look at.

Raydream Studio

Get tweening with this easy-to-use drawing and animation package.

Fractal Systems liked Raydream so much it bought the company — quite a compliment. The Studio package ostensibly consists of four components: Designer, Animator, Extensions Portfolio and Dream models but they all work as a single program which allows you to model, render and animate scenes using ray-tracing techniques. Since this is what has made Steve Jobs rich again through the new Disney film, Toy Story, it's worth a second look.

The hardest part of creating a scene is drawing the shapes — the 500 model comes with software help but eventually you will have to learn to draw in 3D. The modeller has a good Windows interface and makes it easy to construct simple shapes but the single view makes complex work more difficult. Some packages allow you to design in 2D and view in 3D, which is less intuitive but ultimately more successful. You can switch between top, side and perspective views but it's easy to lose the thread along the way.

To attempt to alleviate the problems of doing 3D designs on a 2D screen, the software allows you to edit each object separately but it takes a long while to get the hang of the user interface. This is exacerbated by the changing viewing angles.

Conversely, the animation is a doddle to use. You just move the objects you want to change, which can include lighting, lighting effects and backgrounds, and the software works out the in-between frames for you. This process is known as "tweening". Long animations are both disk and processor intensive so there is a selection of wireframe, flat-rendered and bounding box views.

For many people with a latent desire to see their name spinning in chrome letters, Raydream is the ideal piece of software to fulfil their wish. There is full support for TrueType fonts which can be used to produce simple logos. Chrome can be easily added because textures are held in a special palette.

Glass effects are also possible but you have to roll your own by typing in the characteristics. Reflections can be set to show the same colour as the background: one of a number of custom combinations, such as the clichéd sky and grass effect or a sunset, or even an AVI movie which is played back through an animation.
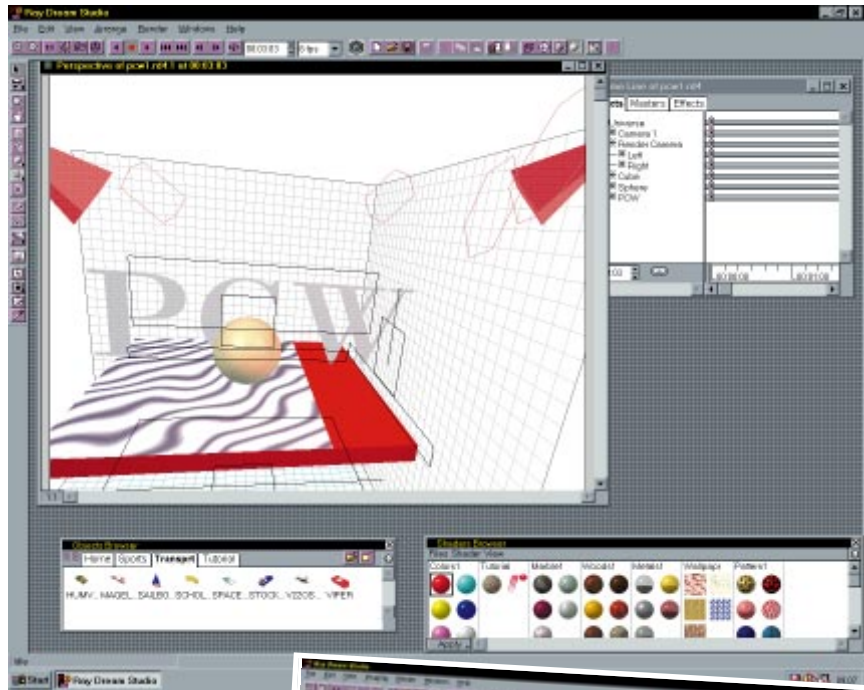
There are none of the advanced features like gate and motion tracking but the system does support different rates of tweening and cameras move on dollies. There is a good selection of alignment tools, although this can sometimes work the wrong way and an object ends up moving to the camera when you actually wanted it to move away. There's also the incredibly useful "point at" command which centres the attention of a camera, or light, on a particular object.

It is possible to achieve atmospheric effects such as fog and mist which give a tremendous degree of realism to images. With persistence, patience and a Pentium you'll be able to produce some convincing animations.

Simon Rockman

Top *PCW gets rendered*
Above *It's a doddle to create 3D animations with Raydream Studio*

PCW*Verdict*

Price £375
Contact Raydream 00 33 1 69 41 97 22

Good Points Quick and easy to use.
Bad Points Views are sometimes difficult to set up.
Conclusion Has the potential to absorb all your spare time.

Fanfare! Presentations

Strut your stuff, on a budget.

With the emphasis on whizz-bang sound, graphics and video technology, Softkey is aiming Fanfare Presentation at everything from corporate presentations, through software and on-line catalogue demonstrations, to interactive courseware and kiosk applications. This is quite a claim for a product that only costs 40 quid.

The installation program is extremely easy and takes less than a minute from CD-ROM. Users installing the package can also read the online documentation, which provides them with basic information on constructing presentations and using the media features. The online documentation is provided in a presentation format.

The program is backed up by paper-based manual which goes into more depth. This is not too indigestible, though, providing an easily-chewable 34 pages of instruction. The conventional Windows Help menu provides further backup for knowledge-hungry users.

Probably the first good thing about the package is that the user gets to choose whether they want a Windows 3.x or a Windows 95 installation. This is impressive, as many programs don't offer such a distinction.

When installation is complete, firing up the program presents you with a swirling mass of objects as an introduction screen — this is an animation, and is stored in one of the many file formats that the program accepts including FLI, AVI, MOV and WAV. Sixteen file formats covering video, sound and image data are supported.

The multimedia facilities are demonstrated using several example presentations which use a host of images and sound clips. The multimedia "events", as the program documentation calls them, are all supplied on the CD-ROM and can be used within the user's own presentations.

For such an inexpensive product, there is a reasonable amount of functionality but there are some gaps that could do with filling. One of the main gaps is in the program's lack of OLE or DDE support, which means that you cannot launch applications directly from presentations by

Above *Fanfare's user interface can be a little confusing*

Left *A host of multimedia features is provided*

clicking on embedded documents. There is a separate application launcher button in the presentation toolbar but this is not as useful as it doesn't allow you to launch specific documents with just one button click, as OLE objects do.

Fanfare, like other presentation packages such as Microsoft Powerpoint, enables users to show thumbnails of their slides. However, unlike Powerpoint, Fanfare includes an organisation box which is separate to the slide thumbnail window. This enables users to make links between the slides, making presentations interactive. You can insert buttons directly into slides, directing users to other slides so that they can take different paths through presentations. This means that you have to separate out buttons into "control" slides and "non-control" slides but the program makes this easy by painting symbols onto the sides of the control slides in the thumbnail box.

This interactive functionality is the most powerful aspect of the product as it enables users to design presentations which will appeal to different types of people, simultaneously. The down side is that, at first, configuring the links between the different slides is a complex business. It takes a good hour or two to get the hang of it, although once users understand what they are doing they will be able to quickly build presentation structures.

The button functionality is useful but the way in which it is implemented can be irritating. Like Powerpoint, the product works on a layering system with different media events being layered behind or in front of other events. This means that to implement a button with a logo on it, you have to make the button transparent and move it in front of the logo, rather than behind. If you fail to do this, as I did, you can spend hours trying to work out why the button doesn't work when you run the presentation.

The other features of this product, including the runtime compiler, the encryption software (which stops presentations being edited later) and the intuitive file-finding software, all add to its value and make it a useful addition to anyone's software library. These functions are a sign of high power, but sadly take a while to get to grips with.

Danny Bradbury
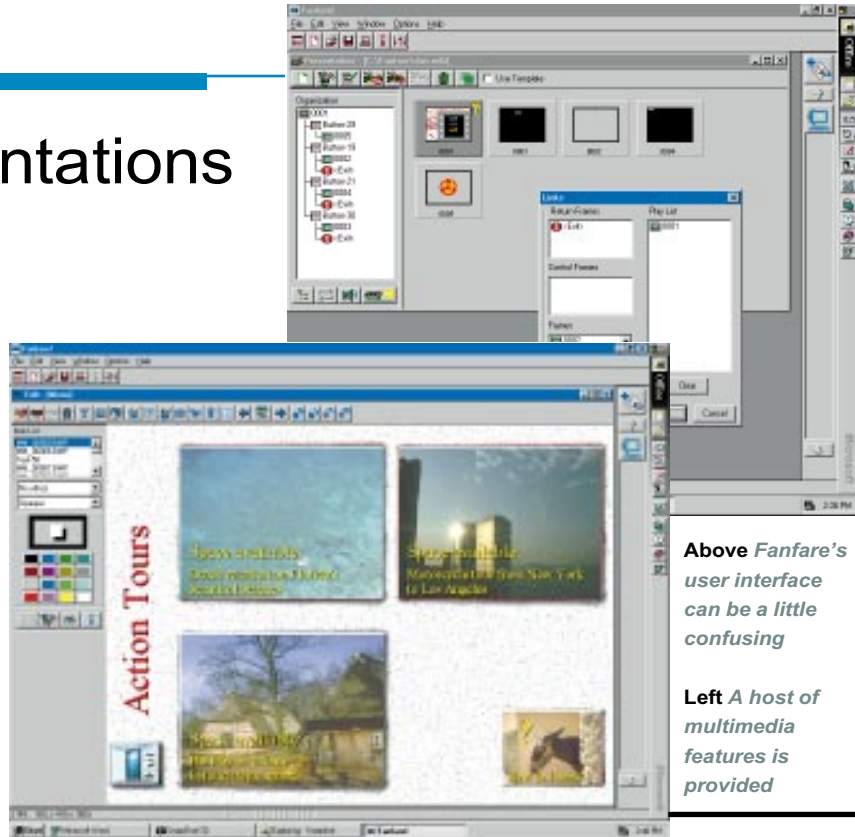
PCW Verdict

Price £39.99
Contact Softkey 0181 789 2000

Good Points Highly functional. Good multimedia and interactive capabilities.
Bad Points Slightly confusing interface; it takes some time to really get to know the program.
Conclusion A must-buy for presenters on a budget.

SOFT WARE

Turbocad 2D/3D V.3

This all-in 2D / 3D package with a new interface provides hours of fun but needs better integration.

Turbocad 2D/3D V.3 is not a single 3D computer aided design program but rather two separate applications. The review sample came on two CDs and floppy disks, and included Windows 3.1 and 95 versions of Turbocad 2D, a single version of the 3D program and some symbol libraries (the CAD equivalent of clipart). Extra libraries and utilities can be "unlocked" from the CDs via phone and credit card.

Taking the 2D side first, the Turbocad interface has been drastically redesigned, and has a very "Office 95" feel to it, with tabbed dialogues, multiple button bars and even a tip of the day. A series of online tutorials takes you from line-drawing basics to the finer points of dimensioning. By default, you get four toolbars. Top left are the usual file, clipboard and undo buttons, with the drawing tools alongside. Left of screen is the "snap" toolbar and right of screen are the view controls.

Snaps are a CAD essential, and restrain the position of points. Snapping allows you to connect new lines exactly to the ends or mid-points of existing ones, to the centres or quadrants of circles, or restrict lines to 90-degree steps. These remain effective until you cancel the snap but you can now activate or override a snap from the "local" right-mouse menu on a one-off basis. Another great improvement is the introduction of active multiple snaps, so you can snap to the end or mid-point of a line, depending which is within range of the snap "aperture" (range).

Dig in to the menus and you'll find many more toolbars. Each drawing tool has a "flyout" of sub-options, which can be displayed as a free-standing bar. The circle tool, for instance, offers various means of creating circles and ellipses such as centre-radius, or passing through three points. Though you can't create or modify toolbars, you can drag them around the screen or dock them at the edges.

The drawing tools themselves are excellent, and include a double line tool for drawing walls or pipes. At any time you can activate the edit bar for precise numeric input of co-ordinates. Though spline and Bézier curves are both supported, precise editing of these is poor but this probably won't be an issue with most engineering or architectural drawing.

The local menu offers context-sensitive choices: if you're drawing shapes made from multiple lines, for instance, you can end or close the shape, erase the last segment or cancel the entire thing. Object-editing tools are good, with well thought-out trimming, filleting and chamfering and a lovely tool for cleaning up the intersections of double lines. There are also excellent array tools for making multiple copies either in a grid (windows on a skyscraper) or a circle (teeth on a gear).

There's a generous selection of symbols included, which can be dragged-and-dropped from a "library" palette, but the snag is that these aren't sized in real-world units but rather in the scale of the drawing they were taken from. So you get anomalies such as a kitchen sink one-third of an inch long, or a washer four feet in diameter, and you have to scale these manually. Finally, there's a Basic-style script language and some sample macros.

Turning to the 3D side of things, Turbocad 3D bears an uncanny resemblance to a program formerly known as 3D Design Plus. IMSI has clearly made some deal or acquisition along the way, taken 3D Design Plus and thrown it into this package, renamed as Turbocad 3D.

IMSI has left it virtually untouched so, unsurprisingly, the interface bears no resemblance to the genuinely new 2D Turbocad product. The drawing tools are located in a fixed row across the top of

Top *A vastly improved interface with buttons wherever you want them*
Above *Modelling and shading from the artist formerly known as 3D Design Plus*

the screen, while the drawing area is split into three viewports. Each can be rotated to any angle, giving you three different views of the model. You work in 3D either by specifying X,Y and Z co-ordinates or by rotating the view.

There's a range of 3D objects such as cones, boxes and cylinders and you can create more complex shapes by "extruding" 2D forms along a straight or curved path. You can shade views, apply basic ray-tracing and textures and even create animations. It's fun, but not really serious 3D CAD. There's also minimal integration between the two modules, but you can build on a 2D drawing in the 3D module, or edit a single view of a 3D drawing in the 2D one.

Tim Nott

PCW Verdict

Price £69.95
Contact IMSI 0181 581 2000

Good Points Brand new 2D interface is a vast improvement on previous versions.
Bad Points 3D is not integrated, and has a totally different interface.
Conclusion The 2D package is worth it on its own. The 3D is something of a curio, but fun.

Digital Colorwriter LSR 2000 *vs* Hewlett-Packard Color LaserJet 5M

Two second generation colour lasers with very different characteristics but both are departmental printers with excellent connectivity options.

The first wave of sub-£10,000 colour lasers to hit these shores came in 1995 and the second generation has now begun to appear. Hewlett-Packard (H-P) has released a Mk II version of the best-selling Color LaserJet, subtly renamed the Color LaserJet 5/5M while computer giant Digital has now entered the colour laser fray with the high-end Colorwriter LSR 2000. Both printers are squarely aimed at the departmental end of the printer market and so feature excellent connectivity options. They also support PostScript Level 2, but that's the limit of their similarities.

The Colorwriter LSR 2000 is based on the 600dpi P320 Canon engine used in Apple's Color LaserWriter 12/600 PS and the Lexmark Optra C. Unlike it's close rivals, the LSR 2000 uses a very powerful RIP controller: the new Fiery XJE RISC controller developed by colour printer specialist Electronics for Imaging (EFI). The printer can output 3ppm in colour or 12ppm in black and white.

In contrast the Color LaserJet 5M is outwardly identical to its predecessor but uses an upgraded controller featuring a

40MHz AMD 29K RISC processor. However, the printer's resolution and print speeds remain the same as before — 300dpi and 2ppm colour/10ppm mono. Hewlett-Packard has sought to play down the importance of resolution as a measure of print quality, presumably because so many of it's rivals offer superior colour resolution but it then contradicts itself by emphasising the Color LaserJet 5M's latest image-enhancement technology: ImageREt 1200, which claims to deliver 1200dpi-like print quality.

The LSR 2000 comes with 32Mb of RAM as standard, expandable to a maximum of 48Mb. It ships with a 545Mb Quantum internal SCSI hard disk that can be used to store fonts and forms and used for spooling — you can even store print jobs there as well. The Color LaserJet comes with slightly more RAM (36Mb) but has no hard disk option. Three interfaces are supplied as standard on the LSR 2000: Centronics/parallel, twisted pair and thick Ethernet. The Color LaserJet comes with the excellent JetDirect MIO network card, which additionally offers Apple LocalTalk as top of the usual Ethernet connections. Both printers can auto-sense incoming print jobs between the various interfaces and automatically switch between them. The H-P came with the excellent JetAdmin network printer management package — none was supplied with the LSR 2000 but it will ship

with Digital's management tools.

Both printers offer PostScript Level 2 and the H-P offers PCL5c as well. They are both Pantone certified devices and are compatible with a number of colour management standards such as ColorSync 2.0, ICM, Kodak and others. The LSR 2000, however, has the edge in the colour management stakes and comes with comprehensive calibration software for the Fiery RIP supplied on CD-ROM.

All colour lasers are physically large, heavy, devices and these are no exception. Both weigh in at around 50Kg and are supplied on a wooden pallet. They require plenty of space, too, as all-round access to the printer is desirable, certainly in the case of the Color LaserJet 5M. Neither printer is particularly well-endowed in the paper capacity department — both can take 250 sheets with a further 250 via an optional paper tray, which, given their intended departmental roles is a little light. The LSR 2000's tray conventionally and conveniently fits underneath the printer but the H-P's second paper cassette fits, somewhat bizarrely, vertically, at the rear of the printer which makes refilling it slightly awkward. But this is compensated by its ability to print in mono on A3 paper. The LSR 2000 is strictly an A4 printer.

Ergonomically, the LSR 2000 wins over the H-P. The Digital has four conventional toner cartridges (one for each colour plus black) and these are easy to install. H-P has seemingly taken a step back with the Color LaserJet as it eschews toner cartridges in favour of toner reservoirs which must be filled with toner from a bottle. Thankfully, the system is clever enough to avoid the possibility of toner spillage. Commissioning the H-P is a protracted affair, though.

The Digital and the H-P both delivered output at their claimed print speeds. The H-P is by normal standards a fairly fast colour printer, taking 253 seconds to output an A4 page of 24-bit colour, but
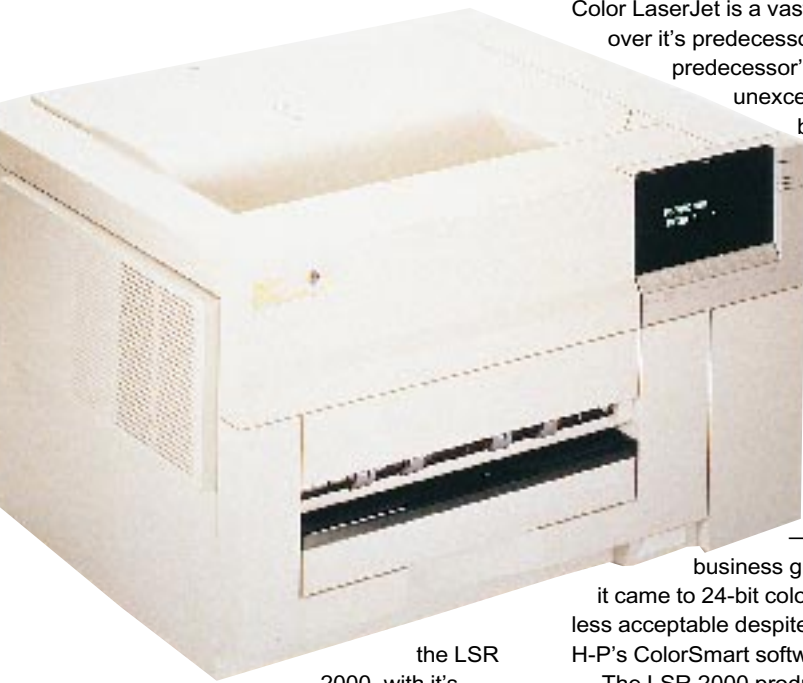
Color LaserJet is a vast improvement over it's predecessor. But as the predecessor's print quality was unexceptional this is no big deal. Its black output isn't bad but when you compare it with the sub-£600 LaserJet 5MP, I'd have to say it's the cheaper printer that's better. Its performance on colour is better, too, particularly on solid colours — the sort used in business graphics. But when it came to 24-bit colour, its output was less acceptable despite the best efforts of H-P's ColorSmart software.

The LSR 2000 produced better overall print quality, on both text and colour. In 24-bit colour it's output was near photo-realistic quality, certainly distinctly better than the Color LaserJet 5M's. The LSR 2000 is capable of laying down true continuous tones and when magnified,

the LSR 2000, with it's superior RIP, was faster: it took 184 seconds to do the same job. Thereafter, both printers could churn out subsequent colour copies at their rated speeds of 2ppm and 3ppm respectively.

On the print quality front, the new

the printed image resembles a series of densely-packed, fine coloured lines. It's ability to reproduce gradient fills without banding or visible artefacts was also impressive.

The LSR 2000 costs about £1,500 more than the LaserJet 5M, but despite this price gulf, I'd recommend the LSR 2000 over the Color LaserJet 5M every time.

Roger Gann

PCW Verdict

Colorwriter LSR 2000
Price £8,600
Contact Digital Equipment 01734 203111

Good Points Excellent colour quality. Fast first page.
Bad Points Only 90 days on-site warranty.
Conclusion Dearer, but the best overall.

Hewlett-Packard Color LaserJet 5M
Price £7,180
Contact Hewlett-Packard 0990 474747

Good Points Wide range of solid colours reproduced.
Bad Points Average graphics quality. Weak ergonomics.
Conclusion Better than the first Colour LaserJet, but beaten by Digital

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SOFT WARE

Quick Address Lite

Pop in a postcode and up pops the address, with this budget-priced utility.

These are hard times for the Post Office, which is facing a threat from email on the one hand and politicians bent on privatisation on the other. So there is little point in complaining about the double standard by which it begs you to make your addresses as accurate as possible and then charges you through the nose for a list of correct addresses.

But Post Office accountants seem to have lifted their eyes from the bottom line for long enough to realise that the money gained from flogging Post Office Address files (PAF), for hundreds or thousands of pounds to junk-mail firms, might be more than offset by the cost of sorting out the mail from the rest of us who, not unnaturally, resent paying for our own addresses.

The result is that software firms have been licensed to make PAF files available at a more reasonable price.

Quick Address Lite is the cheapest yet, at £99. This buys you only limited access — you can look up an address from a postcode, but not vice versa — but it is still extremely useful.

Imagine you are typing up an address, either from a list or from dictation. You need only type the postcode and the rest pops up for you, saving you time and effort and ensuring accuracy. Staff taking down a customer's address over the phone can first ask for a postcode and then double check the rest against the PAF file.

Its developer, QAS systems, has managed to pack 26 million UK addresses and 1.6 million postcodes, with access software, into just six disks. The files unpack into just 7Mb of hard disk.

The utility will work with your system without the need for heavy-duty

The Quick Address dialogue can pop up within any application

customisation. A QAS dialogue box can be summoned from within any application. The address, once accepted, is pasted automatically into the application (a word processor, say, or a database) in a format or your choice.

Clive Akass

PCW Verdict

Price £99
Contact QAS 0171 498 7777

Good Points Good value by the standards of its predecessors.
Bad Points Address from postcode only.
Conclusion Good starter system.

Long term tests

HARDWARE

Star LC-200

5 YEAR TEST

Small, fast and cheap to run. And *very* noisy. It's worth its weight in cotton wool.

Five years ago I bought my Star LC-200 for £200, which is quite a sum for a dot-matrix printer on a teenager's budget. At first I had it hooked up to an old 128K Spectrum, which sent it basic ASCII codes but no graphics. When a year later I moved on to IBM PCs, the Star coped admirably, even with the dodgy emulation sent at it.

It is compatible with nearly every software and hardware combination you can think off. Adjusting its setup is child's play. There aren't any DIP switches to break your fingernails, or any jumpers. It's all done with a system called EDS, Electronic Dip Switches. Very fancy, I hear you cry, but does it work? Well, I can give you a resounding yes. The buttons on the panel control everything you could possibly think of, without opening up the printer. Everything from paper size to emulations can be adjusted via the EDS.

The printer has been cheap to maintain: I go through one black and white ribbon every three months, and a colour one every six. Soon I will have to replace the printhead, because it's getting worn. This is quite easy, involving just two screws and a small ribbon connector.

It has proved very reliable too — nothing has gone wrong in the past three years. Many of my friends have bought other printers, and have been caught out when these have broken down. It's at about this time they come round my place with a floppy, and start to eat humble pie as their work comes out of the Star at warp speed, looking better than ever.

I can't fault Star's documentation and manuals. They are well written, clear and concise, with chapters specifically devoted to PCs and MSDOS. Each time I've written to the company for help, they have responded quickly with the correct information. The latest set of drivers are such an improvement with Windows — the output looks dense and black. With a new ribbon, the colours are vibrant. The Star takes every sort of stationery available, including labels, without a single paper jam.

Dot-matrix printers are generally under-rated; most people disregard them as a nuisance, but if looked after, they will produce good output. As a bonus they are cheap to run, although you will go through a couple of boxes of cotton wool because the noise they generate is quite diabolical.

I would urge anyone looking for a small, fast, cheap printer to take a long hard look at the Star. There isn't much chance of you buying a new one, though, as it has been superseded by the LC-24 and XB professional range.
Mark Lakhani

If well maintained, small dot-matrix printers like the Star LC-200 are an excellent investment

PCW*Verdict*

Good Points Reliable, adaptable, cheap to run
Bad Points Very noisy.
Conclusion An excellent investment

Price Nearest current equivalent LC-100, £151 RRP
Contact Star Micronics 01494 471111

SOFTWARE

FastMap OS Sheet Manager 3.2

3 YEAR TEST

Pinpointing the areas of outstanding interest in FastMap, used in a professional environment.

Following my local authority's decision in April 1993 to use Ordnance Survey digital mapping as a replacement for paper maps, the search was on for a software package to handle the data and provide the output required. At that time, the choice was not as wide as that available today, but the package we chose still remains at the head of the market.

FastMap is based on the widely acclaimed FastCAD draughting package, a DOS-based program which it uses for its screen and graphics handling routines. This has a number of advantages, but also one fairly restrictive disadvantage. On the plus side, the program is what it says — fast. Compared to other software that purports to handle maps, it is streets ahead in loading and redrawing data. Typically a load, zoom and redraw can take ten to 15 times as long under AutoCad r12 for Windows.

It runs on "standard" hardware (486DX recommended) and the sizes of the converted OS data files are also a fraction of some other packages. The easy-to-use menu system uses script files which can be easily customised to a user's requirements, and title blocks and outlines can easily be designed using the extensive CAD facilities. These can also be used to add drawing entities to maps.

As well as vector data, FastMap supports both mono and colour raster data, OS Address Point and a variety of external databases. It is also possible to incorporate scanned images or other drawings into the map. This can be used to superimpose, say, a layout of a development onto a vector or raster image, which never fails to impress.

On the down side, FastMap's reliance on FastCAD can cause problems. FastCAD imposes a limit on the amount of data that can be loaded before the system gets brain-fade. This is approximately 4Mb, probably enough for even the largest mechanical engineering drawing but it soon gets used up when loading large-scale digital map data. It is possible to reduce the level of detail displayed, but this still means that we cannot load all 640 sheets in the borough, even at the lowest detail. (Although, it must be said, only a few sad cases would want to.)
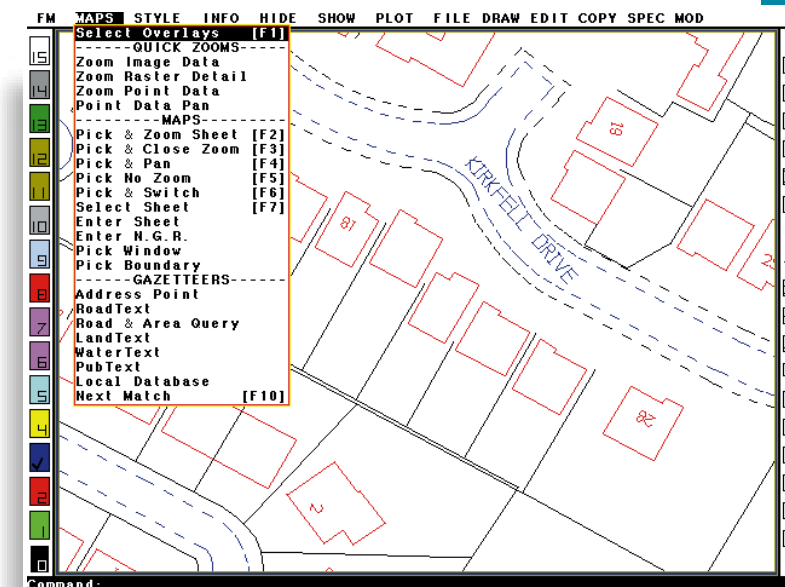
Within my department, FastMap has been the catalyst to the widespread acceptance of desktop computers and their benefits. Those whom I had considered rabid Luddites took to the system like a small boy to a muddy puddle and rapidly began to see the uses and advantages of the other systems we have in place. This can only be put down to the ease of use of FastMap and the short learning curve required for competence.

Survey Supplies, which writes and markets FastMap, has a policy of listening to its users both by direct contact and at well-attended user group meetings. This is borne out by the numerous improvements incorporated into the system since we took a copy of version 2 on trial about two years ago. The most significant of these include dynamic rotation and scaling of title blocks, the reduction in memory requirement, the restructuring of the system files to improve networkability, major improvements to the GIS (Geographical Information System) facilities, and a *vast* improvement in the quality and content of the manuals.

GIS functions are well catered for, especially if all data is to be captured via FastMap itself, which uses a dBase format internally. There are a number of links to proprietary database systems (such as the Hilight street lighting database among others), but occasional problems can occur when attempting to incorporate external databases which are not directly supported. We had enough difficulty linking to DataEase that we decided to use another GIS, but we have since found out that this problem has been rectified and was not all down to FastMap. I have set up a number of small "one-off" databases using FastMap for other Departments, and these have proved very successful.
Steve Hubbard

Breaking the speed limit: FastMap is just that — fast, and full featured

PCW*Verdict*

Good Points Fast, easy to use, fully-featured.
Bad Points Only 4Mb of data can be loaded at a time.
Conclusion As a map-handling package it cannot be bettered

Price £2,500 (single user; multiple users on sliding scale), £1,250 for 2 to 10 additional copies
Contact Survey Supplies 0151 931 3161

C4
yourself

The latest C4 version of AutoCAD is fully compatible with Windows 95. There are some new features and enhancements, too. But will it win new friends?

SINCE MAKING ITS DEBUT 14 years ago at Comdex, in Las Vegas, AutoCAD has established itself as the world leader in high-level Computer Aided Design (CAD), with a user base of over a million on PC and Unix platforms.

From the original two-dimensional drawing software, it grew and grew. Wire-frame 3D capabilities and the AutoLisp programming language were added in 1985. In 1990, Advanced Modelling Extensions offered proper, solid modelling with shading and Boolean operations such as "drilling a hole" in a cube with a cylinder. Then, in 1993, version 12 brought AutoCAD to Windows, and in the following year version 13 brought a whole raft of interface and feature improvements including 70 new commands, a spelling checker and TrueType support.

Although CAD uses the same vector geometry and click-and-drag drawing techniques as illustration software, the resemblance is only superficial. For a start, it offers a much higher degree of accuracy. Secondly, high-end CAD offers true 3D modelling, though the screen display is as flat as a traditional drawing board. It's like a camera — you can view the model from any direction, work inside it, apply perspective, shading and so on.

Custom solutions
AutoCAD is used for designing items as diverse as oil-rigs and micro-surgical instruments. The challenge lies, therefore, in producing a core product that can be tailored to suit all designers.

To this end comes AutoCAD's fabled customisability and open architecture. Practically any aspect of the interface can be changed: you can design your own menus, use a mouse, keyboard or digitising tablet. You can program routines as scripts of commands, or in the more complex AutoLisp macro language.

So while Autodesk continued to develop its product, the open architecture and provision of various programming tools made it possible for third parties to develop "vertical" solutions, so now over 4,000 third-party add-ons are available.

After AutoLisp came the AutoCAD Development System which was added in version 11. Version 12 brought Advanced Visualisation Extensions, for third-party C-compiled add-ons and SQL extensions for database connectivity.

The Windows version also brought Dynamic Data Exchange (DDE) to the drawing board. A sample application showed a shaft modelled in AutoCAD, with the engineering parameters calculated in an Excel worksheet — as you changed the latter's load, speed or material properties
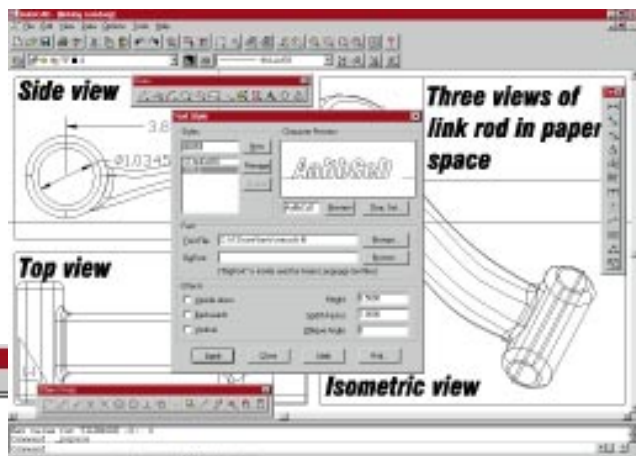
Above *In paper space — arranging views for plotting and adding text*

Left *The command-line text window provides a history of all your actions*

the former's dimensions were dynamically adjusted, and vice versa.

Getting in a GUI mess
Though version 12 ostensibly brought AutoCAD to Windows, it wasn't a happy match. The chief GUI enhancements were an "Aerial View" window, which let you zoom or pan the working area via a miniature overview of the entire design, and a single floating toolbar.

This latter could contain up to 36 user-defined buttons in one large, disorganised pool. Version 13, launched in November 1994, made a much better

Left
A robot arm model — four views with "hidden lines" removed top right

Below left
Working in model space — three wire-frame views of a car wheel

Below
Navigating a large drawing with the Aerial View

job of the Windows challenge with multiple, configurable toolbars grouped by task — drawing, dimensioning, modifying and so on, each with "flyouts" offering related options. ToolTips, online

tutorials and thumbnail previews also made their début in the first major attempt at civilising the harsh AutoCAD environment. Yet another programming interface — the object-orientated AutoCAD Runtime Extensions (ARX) — was added.

Commanding presence
This release, 13 C4, offers a handful of new features, minor enhancements and one major change — full Windows 95 compatibility.

A single CD contains versions for DOS, Windows 3.1, 95 and NT as well as copious online documentation to complement over 2,500 pages of printed manuals.

To understand AutoCAD, it's important to realise that at the heart of the interface, the product is still command-line driven, just as it was in 1982. You can still type "c <enter> 3,2 <enter> 1 <enter>" and produce a circle whose centre is at the X,Y co-ordinates 3,2 and which has a radius of one unit. As you enter a command, various options or prompts for further information appear. With the circle command, for example, if you type "2p" after the first <enter> you will now be drawing a circle defined by two diametrical points and be prompted accordingly.

It's easy to knock the Command Line Interface (CLI) as being woefully old-fashioned but it does have one tremendous advantage. In technical drawing, much of the input needs to be made numerically — you don't draw a wheel that "looks right" but a wheel that is exactly 600mm in diameter. The CLI means you can type in those figures

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Hardware: have you got what it takes?

The official hardware requirements for AutoCAD R13 for Windows 95 are a 386 with a co-processor (or 486 DX where the latter is built-in), 16Mb of RAM (32Mb for NT), 48Mb of disk space for the program, another 64Mb for a swap file, plus a pointing device and Windows-supported display adaptor.

But with an application costing over £3,000 it's foolish to stint on hardware. In practice, CAD is intensively number-crunching so the faster the processor, the better. More memory is always helpful, especially with large models if one is to avoid the delays caused by swapping data out to disk.

The other big demand is display. A resolution of 1,024 x 768 and a 17in monitor should be regarded as the bare minimum for serious work — and if you're not serious, you don't need AutoCAD. The program itself only supports 256 colours, so a display card with 2Mb of memory will take you up to a comfortable 1,280 x 1,024 pixels. If you're using built-in or add-on rendering you really need 24-bit colour — 8Mb of video memory will take you up to a luxurious 16 million colours at 1,600 x 1,280 pixels. What's really important is redrawing speed, and here it's the processing power of the graphics chip that counts.

Autodesk, as a matter of policy, doesn't endorse hardware products but the distribution channel has no such qualms: AutoCAD dealer, Force 2, recommends and supplies the Elsa series of CAD-specific graphics cards. All have AutoCAD drivers, and range from the Winner 1000 (up to 1280 x 1024 x 256 colours) to the flagship, Gloria, a 3D specialist with both S3 968 and GLINT 300SX processors, which offers 24-bit colour at 1600 x 1280 resolution.
● Force 2 is on 01844 261872

planes while drawing on a fourth; plus it poses problems such as where to put text.

If you place this on the ground plane, it will be invisible when viewing from the side, or distorted when viewing in perspective. To cope with this, AutoCAD introduced the concept of "paper space" in release 12. Working in paper, rather than model space, you can combine multiple resizeable views on a single "sheet" with all annotations in the plane of the paper. To complement this come three new commands for extracting 2D profiles and sections from 3D objects.

Putting on the styles

There's a new dialogue box for managing text styles. Unlike most Windows applications, AutoCAD doesn't use the typefaces already installed on your system, and you don't get a drop-down list of fonts available when you want to add text to a drawing. The reasons for this are historical: AutoCAD uses its own vector fonts designed for fast output on pen plotters and it was only in version 13 that TrueType was supported at all. The new dialogue provides an easier way to create font styles — similar in principle to word processing but with added options such as mirrored, slanted or upside-down text.

Although several AutoCAD own-brand .SHX and TrueType typefaces are included, you can access fonts elsewhere on your hard disk. There is a problem, however: browse to your Windows\Fonts folder and you'll find you can't select any of these because Windows lists the font names, such as "Times New Roman", whereas AutoCAD expects filenames like "TIMES.TTF", so you have to find out the filename and type

directly, without having to switch to an input box on the screen.

If you want to use the Windows way of doing things, then you click on the circle tool in the "Draw" toolbox. Six ways of drawing a circle appear as flyouts: choose one and it becomes the new default, the "home" button on the flyout, saving time if you want to draw a series of circles by the same method.

The beauty of the system is that you can mix and match: click on the circle tool, say; click on a point on the screen to position its centre; then type "5" for the radius. This version provides a new variant on this approach, called "direct distance entry", where you drag the pointer to set the direction of an action and enter the distance with the keyboard. This is an especially neat time-saver when working in "Ortho" mode, with lines constrained to a rectangular or isometric grid.

At other times, it's annoyingly inconsistent. When you finish a drawing command, AutoCAD goes back to "select" mode or waits for a new command — it doesn't assume you want to keep on drawing circles.

This is fine, especially as a right click repeats the last command. Except it doesn't work properly. Draw a three-point circle using the buttons and, as we saw earlier, next time you choose the circle button it's already set to three-point, so you don't have to wait for the flyout to appear. But if you press the right button (or

<enter>) to repeat the command, it returns to the AutoCAD default of centre-radius. It's the sort of anomaly that should have been corrected in a maintenance release, but wasn't.

3D drawing is complicated. You may be viewing a model in several different

Taking the online tour

Three-Dimensional Drawing and Viewing
Surfacing a 3D Model

Using AutoCAD's sophisticated 3D modeling technology, you can easily design and visualize parts that have complex sculptured shapes.

The next three pages show examples of some frequently used AutoCAD surfacing commands.

it in manually.

There are two new SQL drivers, for Informix (DOS) and Oracle (Windows). "How to…" cue cards now supplement the tutorials to cover the drawing and editing fundamentals. C4 also provides base support for the AutoCAD Runtime Extension (ARX) with new commands for loading, unloading and providing information on ARX applications. The programming interface itself is included but development tools, including documentation, libraries and sample code will be distributed separately as the ARX Software Developer's Kit.

ARX provides "powerful facilities that support the development of a new generation of design automation solutions based on object-orientated technology." In plain English, this means that you can create drawing "objects" that behave in a more object-like way rather than being just "dumb" sets of vectors. ARX modules are implemented as Windows DLLs (Dynamic Linked Libraries), rather than being added to the core code of AutoCAD itself.

Coming alive with 95
Undoubtedly, the big news is Windows 95 compatibility and the benefits it brings. Performance should be, according to Autodesk, around 20 percent faster, thanks to the elimination of the 16-bit bottleneck.

Certainly, the subjective impression was of far smoother multi-tasking than in previous versions. OLE2 implementation has now been improved (you can drag and drop objects into AutoCAD) though you don't get "in-place" editing.

There's a Windows 95-compliant "Uninstall" routine, support for UNC

pathnames and integration with Microsoft Exchange for sending drawings as email attachments. In terms of sheer preservation of sanity, the introduction of long filenames is bound to be universally welcomed. With the profusion of drawings in a design practice, GHLFPR2A.DWG might mean something to the originator, but for everyone else it would take an inspired cryptographer to realise that this means "Grand Hotel lobby floor plan — revision 2a"; a name that is otherwise perfectly acceptable.

Some way to go
Nevertheless there is still a lot of room for improvement, as Autodesk itself is only too aware. The company still hasn't cracked the Windows Multiple Document Interface so it's still not possible, amazing as it may seem, to load more than one drawing at a time.

However, what you can now do under Windows 95 or NT is to run more than one instance of AutoCAD, each with a separate file. This was actually a feature of release 12 but disappeared with the initial Windows 3.1 version of release 13.

Other smaller but annoying lapses show lack of attention to detail: buttons don't "stay down" to show when they are active; and similarly, some menu options don't stay "ticked".

The multiple configurable toolbars of R13 are a vast improvement over R12 and have both ToolTips and a hint line to show what each button does. Button bars can be customised by dragging, in a Microsoft Office-like manner — select a category, then drag buttons from the available commands on to the bar of your choice. This would be fine except the explanations dry up here — you have to

drag the button on to a bar before you can find out what it does.

In view of the awesome might of AutoCAD these may seem like niggling complaints, but I disagree. This is, after all, a drawing program and the whole point is to make things as speedy and seamless as possible for the electronic draughtsman.

AutoCAD has come a very long way since its DOS-only days. As late as release 10, if you wanted to do something as trivial as changing the size of dimension line arrows, you had to remember what DIMASZ meant, as well as the names of the other 30-odd system variables governing dimension parameters. Now it's all done in a civilised manner from dialogue boxes.

If you wanted to open a file you had to jot down the name as it was impossible to view a directory listing from the same screen as the "Open" command unless you used third-party file management utilities. Now we have standard Windows "File/Open…" dialogues with thumbnail previews, and long filenames. However, as a Windows application, AutoCAD still has a long way to go — to create a custom line type or hatch fill you still have to edit a text file, you can't just draw it and "save as".

To buy or not to buy?
Anyone running Windows 95 using the earlier Windows version of Release 13 should undoubtedly upgrade — it costs nothing and you get the immediate Windows 95 benefits, mentioned earlier, as well as the other enhancements. Those with the Windows version of Release 12 should think seriously about upgrading, too. The increase in productivity brought by the vast improvements in the R13 interface should repay the upgrade cost in a very short time. For new users, the decision is tougher. The complexity and rough interface edges still make for a long and hard learning process.

Autodesk may be able to count on the loyalty of its installed user base, many of whom learnt, and are happy with, the keyboard CLI. But to make new friends, it needs to go further down the path of Windows compatibility.

Tim Nott ◾

Serving
suggestion

Paul Begg takes you on a gastronomic tour of cooking by computer.

I T WAS FRIDAY LUNCHTIME IN the *Sugar Loaves*. A group of us were winding down for the weekend. Suddenly it struck me that we had spent half an hour talking about food and were now actually exchanging recipes and cooking tips. That evening, I popped into the *Windmill* (for medicinal purposes, you understand), and lo and behold the conversation was about food in there as well.

I mention this because a few years ago you could have been forgiven for thinking that we were living in a pre-packaged age. Hardly anybody baked anymore. Preserving and pickling was almost a dead art. And if it wasn't in a foil dish to cook for 25 minutes in the oven or in a bag to boil in water for a similar duration, it wasn't recognisable as food.

How things have changed. Not only do a bunch of men discuss cooking along with football over a pint, the supermarket now offers real bread, loads of fresh vegetables and herbs, exotic fruits, proper cheese. Cooking programmes on television seem to proliferate, headed by Delia Smith, with BBC's Food Programme, Lloyd Grossman, and a host of shows on satellite TV. In fact, a few months ago a speedy finger on the remote control could get you over two and a half hours of food programmes on a Thursday afternoon — for me, that's pretty close to heaven. (Actual heaven would be two and a half hours in a good Italian restaurant.)

I also like cookery books almost as much as I love cooking, which comes a close second to my love of eating. But cookery books are special. They look nice on a shelf, have a nice feel, promise delights, can be read purely for enjoyment, and the food stains on the pages bring back memories of great meals and old friends. I never thought I could give up a cookery *book* for a cookery book on my computer. Today, I can't imagine looking for a recipe without my computer to hand.

There are several reasons. Have you ever wanted to find a recipe,

"I thought my mother was a bad cook, but at least her gravy used to move about." — Tony Hancock

but not known in which recipe book it is? When you use a computer recipe database, finding just the recipe you want is the work of a moment. You can also search for recipes which contain ingredients you have in your store cupboard. With some packages you can also add your own recipes, so say goodbye to that scrapbook full of cuttings from the Sunday colour supplements and those magazines you buy while waiting in the supermarket queue. And those stains on the cookbook pages may bring back memories of culinary delights, but they can be unhygienic. With a computer you can print out the recipe afresh every time you use it or keep it in a wipe-clean plastic envelope. You can also print out a shopping list.

There's also the sheer number of recipes you get on a CD-ROM. Some of the titles reviewed here contain hundreds of recipes. A couple contain about 10,000 — that's a whole library of recipe books. These are the reasons why the computer in my home is as important as the cooker.

You find electronic versions of almost every type of cookery book you can

discover in book form. We've looked at just a small selection across three broad categories, from master chefs through to international cuisine to recipe databases.

Cooking with the masters
Mrs. Beeton's Book of Cookery and Household Management
Even someone whose culinary abilities don't extend beyond burning water has heard of Mrs. Beeton. Isabella Beeton (1836-1865) was 24 years old when she wrote the Book of Cookery and Household Management, the most successful European cookery book ever published. She revised the book once before dying in 1865, following the birth of her fourth child. The fortunes of her husband and publisher, Samuel Beeton, declined dramatically thereafter and he was eventually forced through bankruptcy to sell his copyrights to the publishers Ward, Lock and Tyler. These publishers continued Mrs Beeton's revisions, adding and deleting from the book as times and tastes changed

The book was unique in many ways. It was the first cookery book to list the quantities of ingredients and the approximate season for each recipe (an interesting reflection on the industrial age, people being born in towns and having no idea when certain vegetables and fruits were in season), and the book, though now bearing little resemblance to the original, is still published. This edition takes Mrs Beeton into an electronic age she would never have imagined, but still gives useful information on all manner of household management, from budgeting to choosing a microwave.

There are over 2,000 recipes, and you can search this huge database by all manner of criteria. Once you have found a recipe that fits your needs, you are provided with a list of ingredients and cooking instructions. There is also assorted information such as the main ingredient, the source for the recipe

Mrs Beeton — lots of great recipes with a winning database

First visit to the United States.	**1907**
Professional Jubilee in honor of Escoffier, who requests that the amount collected for his gift be donated to the Home for retired Chefs.	**1909** Louis Blériot is the first to fly across the English Channel (July 25).
Publication in "Les Carnets d'Epicure" of an essay on the benefit of social security.	**1910**
Great fire at the Carlton. Escoffier narrowly escapes unhurt.	**1911** Invention of air conditioning in the United States.
Second meeting with the Kaiser Wilhelm II, on board the IMPERATOR, flagship of the Hamburg-Amerika Line, during her maiden cruise. Second trip to the United States. Publication of "Le Livre des Menus".	**1912** French protectorate established in Morocco. Sinking of the TITANIC.

Escoffier — relive the best food at the best tables in Europe

(usually Mrs Beeton), the dish's position in the course (starter, main course, dessert), whether it is presented hot or cold, whether usually eaten for lunch or dinner, what country it comes from, the preparation time and cooking time. Some recipes also have attached nutritional information and sound, and a few are accompanied by a picture.

You can create a shopping list, but if you want to add your own recipes or annotate those provided, you will need another software program called the Micro Kitchen Companion (see below).

Good Points Huge database of delicious recipes.
Bad Points Needs the Micro Kitchen Companion for full functionality (recipe adding).
Conclusion Good, solid database of recipes. Excellent Micro Kitchen Companion.
Contact One Stop Direct
Tel 0181 947 1001
Price £24.99 inc. VAT
Rating ● ● ● ● ○

Micro Kitchen Companion

Mrs Beeton belongs to the Micro Kitchen Companion range. This is an extensive collection of standalone recipe packs which use the Micro Kitchen Companion (MKC) database. Each comes with a cut-down version of the database, but to get the full functionality you need the MKC Premium version, which actually comes jam-packed with recipes itself.

The trouble with Micro Kitchen Companion Lite is that it keeps all the recipe collections separate. With the Premium edition you can merge the various databases to produce a single, massive cookbook. You can search this monster with ease, discovering delicious recipes in a way impossible with conventional cookbooks. And, of course, you can add your own.

The MKC has extended search

features. You could, for example, find a recipe by its country of origin, its method of cooking, that will be ready in a given time and has less than a specified number of calories. You can print the ingredient list of the currently displayed recipe or selected recipes. You can also print a shopping list, and because you'll have some of the ingredients you can just choose to print selected items. You can add items to the shopping list so your printed list includes everything you want to get from a trip to the shops, even cleaning materials such as a bottle of Domestos.

There is a nifty little Shopping Wizard which is great. As well as printing out the recipe, it looks for a keyword. For example, it would take half a pound of cauliflower florets, note the keyword "cauliflower", then associated that word with where to find it — i.e. the vegetable department of the supermarket (you can specify your own stores if you sensibly buy from local shopkeepers). The program lets you sort your shopping list by store or department. For example, you can have the program automatically do its best to list all the ingredients by type, so it will take cheese, butter, milk and so forth and put it under "dairy". You can combine several recipes, so that you are never getting into a

muddle checking your handwritten lists.

MKC has been refined over many years and the latest version has limited multimedia capabilities. It can display photographs of dishes and preparation methods and there's pronunciation guidance (American, unfortunately).

Good Points Superb database. Good range of add-on recipe databases.
Bad Points None.
Conclusion Inexpensive. Give it a try
Contact One Stop Direct
Tel 0181 947 1001
Price £19.99 inc. VAT
Rating ● ● ● ● ●

Escoffier

This is probably the classiest cookbook on CD-ROM you are likely to see for some time. Over one hundred of Auguste Escoffier's celebrated recipes, selected for the home chef and rewritten by a number of authors, among them the master's great-grandson, Michel Escoffier. These are not recipes for the faint of heart — though

The Micro Kitchen Companion range has everything you could ever want from a recipe database

Editor's Choice

This is practically an impossible task. The recipe collections we looked at differ in so many ways, from simple video-like step-by-step instructions to huge recipe databases containing thousands of recipes. And the deficiencies were equally varied. Some offered poor search criteria, others won't let you add recipes; a few didn't even let you print out the recipe, let alone a shopping list.

We were delighted by Escoffier, which had class, though the accompanying music grew irritating, but to use it almost demands that you shift your computer into the kitchen. We also thought Cooking with Dom DeLuise was a lot of fun, had some great recipes and made a good, functional recipe database. But how long will it be before even Dom's infectious enthusiasm gets you down?

The Editor's Choice award has to go to the Micro Kitchen Companion series, which includes Mrs. Beeton and Cook It Light, and a host of other titles. Despite being very American, it is far and away the best recipe database and probably does everything you could want it to. The range of titles you can use with it is extensive and it is possible to combine the recipes from several titles, which makes it even better than a pile of paper cookbooks. The number of recipes in each title, as demonstrated by Mrs. Beeton, isn't bad either. Finally, the price was, for the most part, highly favourable.

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you'll find a host of basic recipes for stocks, sauces and creams — but if you fancy trying your hand at some exotica you'll find over 1,000 pictures to take you step-by-step through the preparation, techniques, ingredients and utensils for every recipe.

Auguste Escoffier (1846-1935) was called "the king of chefs and the chef of kings". He headed some of the finest kitchens in Europe, achieving international fame through his partnership with hotelier César Ritz (they ran the London Ritz together from 1889) and revolutionising cooking in a number of ways. This CD-ROM conveys a little of the grandeur you would have experienced at dining tables in the finest restaurants at the turn of the century, but modified for the home kitchen.

The recipes here are for those very special dinner parties: noisettes of lamb with tarragon, braised duckling, saddle of roebuck; chocolate soufflé or Pears Helene. But, as said, there are a lot of basic foundation recipes too. Want to know how to make a real custard? Or how about a puree of fresh raspberries to accompany a simple ice cream?

The disk contains "Le Chef", a unique tool which takes you by the hand through cooking even the most difficult of menus, showing you what you should be doing and when, and even giving you an idea of the time you should be doing it, so that everything comes together perfectly as your guests shake out their table napkins. You can also print out menus and shopping lists and get some suggestions about the best wines to accompany each course. There's also a biography of Escoffier.

"Never eat more than you can lift."

—

Miss Piggy

Good Points Oozes quality from every pore.
Bad Points It's not a database to which you can add recipes, but was never intended to be, so how can one be critical?
Conclusion A celebration of one of the giants in the history of world *haute cuisine*.
Contact Interactive Ideas
Tel 0181 447 9288
Price £34.99
Rating ● ● ● ● ○

Healthy Indulgences — Lynn Fischer takes you step by step to some healthy and great-tasting food
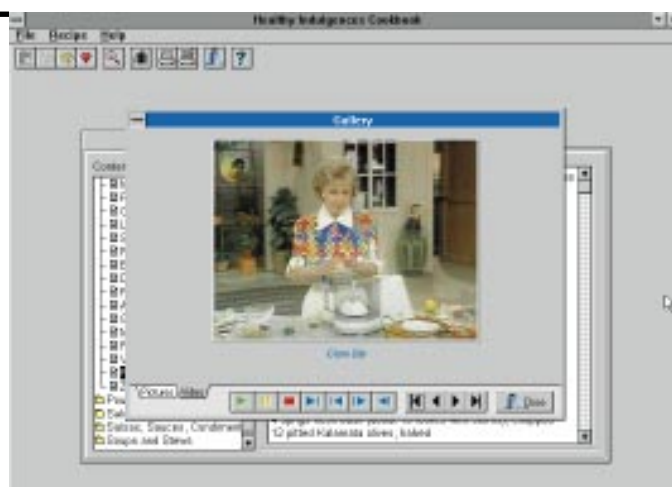
Healthy Cooking

You might go to bed and dream about fat-filled, salt-packed, cholesterol-crammed food. From time to time it is good to have a thorough blow-out, but the fact is that these days you should have a balanced diet of good, nutritional and healthy food. The trouble is that I am more your suet pudding and a pint of Caffrey's kind of person than a lettuce leaf and bottle of Perrier. I don't really want "healthy food". I want the sort of food I like, but cooked in a healthier way. There are several CD-ROMS designed to do exactly this.

Healthy Indulgences

Lynn Fischer hosts a TV series on Public Broadcasting in the States called Lynn Fischer's Healthy Indulgences and this CD-ROM is the electronic version of her Healthy Indulgences Cookbook. The idea is that these are recipes for the kind of luxurious and sophisticated dishes which would send you to confession just for looking at them, yet they have been designed to be low-fat and healthy.

They are over 260 recipes and about one hour of full motion video — irritatingly, Ms Fischer never wears the same clothes twice. Also irritating is her habit of calling everything from a pan to a potato a "guy". But these quibbles aside, the video is very useful. The recipes, however, cover a range of foods from around the world. You'll find plenty here to tickle your tastebuds.

You can search for a recipe by name or ingredient and scale a recipe to serve any number of persons, including just one. You can check the nutritional value of each dish. You can create and print a recipe or shopping list. There are pictures of the finished dish and video footage of the preparation. The shopping list feature, however, is nowhere near as good as you get with the Micro Kitchen

Left *Cooking with Dom DeLuise — food and fun*

Below *Dom DeLuise again — don't use your CD-ROM drive as a food slicer!*

Companion. It simply transfers the ingredients of a recipe so you can print it out. It doesn't combine quantities of the same ingredient required for different recipes, and it doesn't sort the ingredients into types such as pasta, herbs or vegetables. Nevertheless, it beats having to copy out a lengthy recipe by hand.

Good Points Lots of video instruction. Excellent price
Bad Points The tools could be better.
Conclusion Don't look at the recipes if you drool easily.
Contact Softkey International
Tel 0181 789 2000
Price £19.99 inc. VAT
Rating ● ● ● ○ ○

Cooking with Dom DeLuise
You might not know him, but Dom DeLuise is a popular American comic actor whom you'll immediately recognise from *Blazing Saddles*, *Silence of the Hams*, *Burke's Law* and a great little food movie called *Fatso*. He's also a great cook, the author of a series of cooking books and videos, and if he doesn't make you think pasta is better than sex, there's something wrong with you.

This is a two CD-ROM package with recipes accompanied by a huge side-dish of laughter — check out how Dom uses his computer around the kitchen: the mouse as a pestle, the CD-ROM drive as a juicer, the keyboard to crack walnuts.

These recipes don't shove healthy eating down your throat, but as Dom says, the recipes have been "fine tuned to use less butter, oil and red meat. I've included lots of wonderful vegetable, soup and salad recipes. Okay, there are some deserts, too. And pasta, don't forget the pasta." In fact there are two hundred recipes here, so this is no slouch

when you need some delicious meals for yourself or when entertaining. But Cooking with Dom DeLuise isn't really about the recipes. It's a fun database where you can store all your own recipes. More, it provides a useful set of tools. The Shopping List feature lets you print out a list of the ingredients in your favourite recipe. You can add all the ingredients or just some, and edit the list to double or half the quantities to suit the number of people for whom you are catering. You can add notes and make changes to Dom's recipes too.

There is a useful converter to convert American measurements into UK measurements — six teaspoons equal one ounce; that sort of thing. And there is a feature which lets you scale quantities, but it only doubles the quantity. You can also search the database by any word imaginable to find just the recipe you want or one which fits the ingredients in your store cupboard.

Good Points Dom DeLuise is great. The recipes are great, the database is good.
Bad Points Even with two CDs this is expensive. Some of the video shows more of Dom than the food.
Conclusion Fun database, good recipes, desperately needs a price cut.
Contact Comput-Ed
Tel 01626 889955
Price £58.69 inc VAT
Rating ● ● ● ● ○

International Cuisine
One of the best aspects of cooking is discovering the cuisine of foreign countries. You'll find computer recipe books for almost every type of food. Here's one I liked.

Schwartz World Cuisine Recipe Book
Schwartz are the people who make those distinctively bottled herbs and spices you probably have in your store cupboard and this is an unpretentious collection of recipes of dishes from around the world. There's no video, no sound and no pictures to speak of. Naturally, everyone uses herbs and spices and Schwartz's are recommended. I'm quite happy to live with that.

All the recipes are listed alphabetically, along with the type of dish, the preparation and the cooking times. You can list all the recipes on the database or only those of a specific type, such as the main courses. You can also modify the recipes or add new ones.

You can search for a recipe by entering its name or part of its name. If you just type in "chicken", you'll get a list of all the chicken recipes on the database. Some of the searching methods are presented as special features. For example, "What do I have in my fridge?" lets you specify one or more ingredients, then produces a list of dishes in which those ingredients appear. Great if you have a few leftovers in your fridge and you want to use them in a creative way. "Cook in less than ... minutes?" gives you a list of recipes which can be prepared and cooked in a specified time, which is useful when you get home after a busy day and don't want to spend too much time in the kitchen.

If your food bill seems to go up with every visit to the supermarket, you'll love the "Eat for less than £..." feature. Just specify what you can afford to spend and you'll be presented with a host of recipes for great dishes that won't cost you the earth! I was particularly taken with the "What to serve with a bottle of ...?" feature. Most recipes suggest wines to accompany the chosen dish. This feature suggests a dish that would accompany a wine you already have.

Good Points Plenty of recipes, add your own, searching is made easy.
Bad Points No pictures of the finished dishes.
Conclusion Inexpensive recipe database without frippery.
Contact GSP
Tel 01480 496666
Price £19.95 inc. VAT
Points ● ● ● ○ ○

Electronic Gourmet Guide on AOL
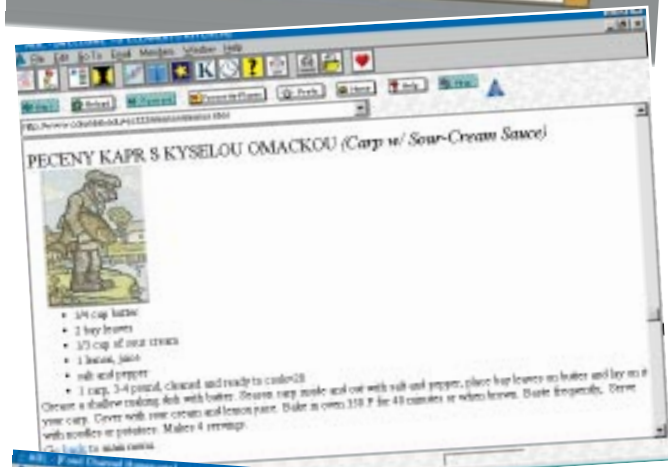
Eleanor's Kitchen — Czech food on the Net

Internet Food Channel — great cooking

foodie's paradise. On AOL you should check out AOL Cookbook, Dinebase, Food, Fitness and Travel, Good Morning America Recipes and Health Diets. CompuServe offers several sites for the *bon vivre*.

The Cooks Online forum is excellent, offering loads of recipes from the basic to the unusual and cannot be recommended more fervently. You can also get help from or just chat with other food-minded folk. The Vegetarian forum is self-explanatory. Plus AA Restaurant Guide and the Good Pub Guide.

The Net is positively teeming with sites that demand a visit. In particular, the Electronic Gourmet Guide (also accessible on AOL) is a must. But to start off, just try the sites listed below. They will lead you to others and still others — oh, heaven is a modem. (Actually it's an Italian restaurant, but I've just eaten and I want to plan my next meal.)

● **Food** — More recipes than chefs to cook 'em. A must-stop-by-and-stay-a-while kind of a site:
http://www.cs.cmu.edu/afs/cs.cmu.edu/Web/People/mjw/recipes/

● **Internet Food Channel** — don't waste time, just visit.
http://www.foodchannel.com/home.html

● **Epicurious** — Just food; bliss and more.
http://www.epicurious.com/

● **The Dinner Co-op** — for cooks and food-lovers; recipes & more.
http://gs216.sp.cs.cmu.edu/dinnercoop/home-page.html

● **Rec.Food.Recipes** — about 21Mb of recipes.
ftp://ftp.neosoft.com/pub/rec.food.recipes

● **La Comida Mexicana** — Mexican food; hot and spicy.
http://www.udg.mx/Cocina/menu.html

● **Eleanor's Kitchen** — Czech food; just don't count the calories.
http://www.columbia.edu/~js322/eleanor/eleanor.html

● **Galaxy** — a guide to almost everything that's food.
http://galaxy.einet.net/galaxy/Leisure-and-Recreation/Recipes.html

● **Food Sites** — brilliant, albeit unfortunately named.
http://www.spew.com/food.html

Best of the Rest

There are several cookery titles, and it has only been possible to scratch the surface with these reviews. We haven't looked in detail at the really BIG recipe databases such as Great Gourmet from Expert Software or Key Home Gourmet from Softkey. Both contain a staggering 10,000 recipes and the latter adds 100 classic drink recipes, complete nutritional analyses of over 4,500 food items, a wine list manager and a glossary of over 500 cooking terms. And whatever the deficiencies of these products — no multimedia, American measurements

and — particularly with Great Gourmet — the incorporation of products not available in the UK, such as Egg Beaters Real Egg Product (whatever that may be), the budget price of either disc simply cannot be beaten.

Shareware, too, offers some interesting recipe titles. Most come with a few recipes — you get more when you register — and we particularly liked A Jewish Mother's Cookbook and the Mardi Gras Cookbook. But shareware excelled when it came to herbs, an area strangely neglected by commercial software.

Cooking online

All the online services have food and cookery sites, and the Internet is a

At your
service

FOR WHATEVER PURPOSE you buy your PC in the first place, it's only a matter of time before you discover the wonderful world of utilities.

These are the handy, often life-saving, little programs that everyone comes to depend on day-in-day-out. They do everything from data compression and encoding to advanced memory management and after a while you just can't imagine how you used to work without them.

While there are literally thousands of utilities available on the market, the majority can be split into six main categories: archive and compression, graphics and multimedia, diagnostic and system, communications and Internet, applications and file management and programming. Each of these areas is filled with a positive horde of useful products.

Particularly well-known utilities include the Internet browser Netscape Navigator, Laplink for Windows, Quarterdeck's QEMM memory manager and the king of diagnostic applications; Norton Utilities from Symantec. But it's not always the commercial products that are the most

powerful — there are several amazing programs of which some are shareware which let you try before you buy, while others are totally free of charge. Paint Shop Pro and WinZip are great examples of successful shareware titles and Aladdin System's freeware, Stuffit Expander, has saved lives in the *PCW* office on a number of occasions.

In this wide-ranging group test, the *PCW* team guides you though nearly 50 of the leading PC utilities, complete with contact numbers, prices and, where relevant, URL addresses on the World Wide Web. In addition, for all our Macintosh readers, we have reviewed the best five products in the Apple world. And as if that weren't enough, much of the shareware and freeware can be found on this issue's free cover-mounted CD-ROM and on the *PCW* worldwide website at http://www.vnu.pcw.co.uk/.

Utilities are the computer user's tool bag. Some are just handy, while others are indispensable. We review over 50 of the leading PC and Mac products.

Contributors: Clive Akass, Dylan Armbrust, Paul Begg, Chris Cain, Adele Dyer, PJ Fisher, Steven Helstrip, Gordon Laing, Simon Rockman, Ben Tisdall, Eleanor Turton-Hill, Nigel Whitfield.

UTILITIES CONTENTS

1 0 8
PERSONAL C
JUNE 1996

1 0 9
PERSONAL COMPUTER WORLD
JUNE 1996

Graphics and multimedia

Adobe Acrobat Reader

From CD-ROM to the Internet, electronic publishing is big business. You can easily and efficiently distribute your information to anybody you wish. But with all these different platforms, systems, configurations and often severely limited bandwidth, which format is best for electronic documents?

Most clued-up companies realised an early foot in this door would be an endless money spinner. Adobe didn't hang around, and came up with the Portable Document Format (PDF), and the accompanying Acrobat series of products.

The PDF format is based on Adobe's PostScript page description language. The clever part is that PDFs contain information about the look of the document, which is retained wherever it's viewed or printed.

Acrobat cannot conjure up missing fonts, but will intelligently substitute to match their spacing, avoiding undesirable reflow.

Retaining the look of a document across platforms is one thing. Another is the size of a file. PostScript files can get pretty huge but Adobe has employed varying degrees of compression with the PDF format. You wouldn't use PDF files for outputting at magazine quality but it's certainly good enough for a laser printer and on-screen use.

What about usefulness? PDF documents may be searched on, while wads of text may be copied to the clipboard for further editing. The Acrobat Reader is an excellent navigator. The final problem is distribution. Applications to create PDF files cost money, but the 1.5Mb Acrobat reader itself is free of charge, and downloadable from Adobe's Web site.

Price Free ● **Contact** Adobe: 0181 606 4000; http://www.adobe.com

CD Grab Audio for Windows

There are two ways to get audio from a compact disc onto your hard drive. The most obvious is to use a digital audio editor to record the material you require. Regardless of the quality of your sound card, though, there will be some loss of quality. For most users this will not be a problem. Within a professional environment, however, the copy needs to be 100 percent perfect. This is where CD Grab Audio comes in.

CD Grab copies audio in the digital domain by reading the zillions of 1s and 0s on the CD and writing them to disc or memory. This can result in a perfect copy of the original data. The file can then be saved in .WAV format for further manipulation in a sound editor.

As well as doing a good job of copying data, CD Grab can access low-level information contained on the CD such as sector locations, number of channels and length of tracks. The TOC (table of contents) display allows you to select the tracks you need to copy.

Alternatively, you can play the CD and press buttons to mark the start and end points of the sections you require. Audio can be grabbed in 8-bit or 16-bit at 11, 22 or 44.1KHz. After the copy is finished, a waveform is drawn for reference.

CD Grab works with any CD drive that supports audio extraction and is compatible with Windows 3.1 and 95.

Price £99 ● **Contact** A. L. Digital 0181 742 0755

QuickView Plus

Inso's QuickView Plus is a great little utility that enhances the features of QuickView, the file viewer built into Windows 95. With just two clicks it lets you instantly view almost any type of data from a word processor document to a Photoshop masterpiece.

Supplied on just two floppies, QuickView Plus provides viewers for over 200 file formats, including Microsoft Word, WordPro, MacWrite, XLS, EPS, TIFF and JPEG. It can also deal with HyperText Markup Language (HTML), needed for development with the Internet, and various compression formats such as Zip, uuencode and Unix.z.

Installation takes just under two minutes and involves little more than a double-click and a disk swap. Once this is finished, clicking any file with the right-hand mouse button brings up the option to display it. While viewing you can scroll around, copy data to the clipboard, search for a string, extract from or add to archives, and print. You can even turn images into Windows wallpaper without a lot of messing about.

Perhaps the only thing missing from QuickView Plus is the ability to edit data directly, but the appropriate applications can be launched at the touch of a button. If you choose, the program can also attach itself as an option to Explorer or any other application.

Apart from that, there's not much else to say about QuickView Plus, except that is a shining example of what a utility should be. It's brilliantly simple and simply brilliant.

Price £39 ● **Contact** Software Compatibility Centre 01344 885224

HiJaak 95

HiJaak began many years ago as a fluent graphics file converter. Cries of: "Can anyone open a dot-wotsit file?" were frequently met with "pass it over here, and I'll run it through HiJaak" — handy stuff but a product has to move on to survive. Recent versions of HiJaak have seen it mature with image manipulation facilities and even more file filters. Last September, Quarterdeck acquired HiJaak's developer, Inset Systems, and has just released HiJaak 95 which promises to "extend the Windows 95 shell to enhance, view, convert, capture, print, find and manage all your graphics".

A complete installation requires 12Mb, after which a new control panel is added, along with a status indicator in the task tray next to the clock. The complete viewing, conversion and manipulation application can be launched by hand but most of the time you'll be accessing the whole thing, or aspects of it, from a right mouse-click.

HiJaak 95 adds six new options to the pop-up menu when you right-click a graphics file and offers additional functions on the properties. From here, you can view, print, convert and manipulate the graphic file to your heart's content. Best of all, though, HiJaak 95 creates thumbnail previews for the file icons themselves, just like a Macintosh.

When QuickView was removed from the final release of Windows 95, the need for a competent graphics utility became all the more important. As a standalone product QuickView is okay but it's HiJaak 95 that truly cuts the mustard. Great facilities and tight integration with Windows 95 make this a top utility.

Price £49.95 ● **Contact** Quarterdeck 01245 496699; http://www.qdeck.com

Screen Thief 95

Screen Thief has been sitting on our network server since its release in 1993 and since then has captured thousands of screens which have appeared in these very pages. The first version was a DOS TSR that utilised a hot key setup to "dump" screens to disk. It was often easy to get carried away when grabbing screens because files were automatically named and saved. On returning to Windows you would regularly find 20 more than you actually needed.

This latest version for Windows 95 has a truckload of features and like its predecessors, uses hotkey setups to grab screens, individual windows or user-defined areas. The program sits quietly in the background until you hit the correct combination of keys. Depending on how you configure Screen Thief, screens can be automatically saved to disk, or viewed in the application for trimming, or cropping. Screens are automatically named according to the application from which they come. For example, a screenshot of the Control Panel would be saved as Control Panel #01, making it easy to identify files.

Screen grabs can be initiated from the application with a delayed capture, giving you plenty of time to hide the cursor and arrange windows. If, on the other hand, you want to include the cursor (or animated cursor), ST95 is currently the only utility that will do this reliably. Eight common file types are supported, including PNG (Portable Network Group).

Price £19.95 ● **Contact** Nildram 01442 891331

Adobe Type Manager 3.02

A popular three-letter acronym such as ATM can be read as many things. For instance: Automatic Telling Machine, Asynchronous Transfer Mode or even Anti-Tank Missile. But in this case, it's Adobe Type Manager, a valuable utility for those using PostScript Type-1 fonts.

Not so long ago there were separate fonts for printer and screen. The printer font was an outline vector description of the character shapes themselves, which could be scaled to any size.

Screen fonts consisted of pre-scaled characters for use on-screen at specific sizes. But at other sizes you would get jagged edges and a poor representation of the final printed output.

Enter ATM, which takes the outline vector descriptions of PostScript Type-1 fonts and renders them on-the-fly at any size for smooth on-screen use. What you see on screen is really what you get on paper, whether you're using a PostScript printer or not.

Of course, the Windows and Macintosh operating systems have had the facility to do much the same with TrueType fonts for some time. But if you want access to the larger and more professional Type-1 font libraries, you'll need ATM.

Currently, in version 3.02 for Windows, ATM is a relatively small utility which runs transparently as part of the operating system (it's built in as standard to OS/2).

It is available for £40 with 13 common Type-1 fonts, and is additionally included with many Adobe products, including Photoshop, Illustrator, Premiere, and Type on Call. The latter is also bundled with most Adobe applications.

Price £40 ● **Contact** Adobe 0181 606 4000; http://www.adobe.com

Paint Shop Pro 32

Installed on just about every PC in the PCW office, Paint Shop Pro is the most popular shareware paint package for Windows.

This new, 32-bit, version is designed with Windows 95 in mind, and comes complete with support for long filenames.

Paint Shop Pro offers all of the basic tools you would expect to find in a paint program, including geometry functions and different kinds of fill patterns. It then goes further to provide functions normally found only in expensive high-end bitmap editing applications such as Photoshop.

Typical examples include lasso and magic wand selection tools, as well as colour histogram adjustment, varying levels of zoom and filters, and also facilities such as Add Noise, Despeckle, Emboss and Sharpen.

The user interface is well laid out, and anyone familiar with other Windows graphics programs will feel at home in minutes. Tool palettes can be turned on or off as required and rearranged on screen to suit individual taste. All tools are accessed using a traditional left-click.

Other notable strings to the program's bow include its support for over 40 different file formats, a browser that lets you quickly scan through thumbnail images of graphics files on your hard drive and an incredibly handy Batch conversion facility.

Batch conversion allows you to select batches of files in one format and then automatically convert them to another. And if that sounds complicated, you can always use the on-line help.

At £49 Paint Shop Pro is a bargain, providing most of the tools you'll ever need for non-professional bitmap editing work.

Price £49 ● **Contact** Digital Workshop 01295 252355

Kai's PowerTools 3

Adobe wrote Photoshop with future expansion in mind. Plug-in technology allowed Adobe and third parties to write easily installable extensions to the program. All Macintosh scanner drivers are supplied as Plug-ins, and a wealth of filters and special effects is also available in this format.

The graphics industry standardised on Photoshop compatible Plug-ins, and most paint and photo retouching apps, including Corel PhotoPaint, can use them.

Perhaps the most famous Photoshop compatible Plug-in of all is Kai's Power Tools (KPT) now at version 3 for both Macintosh and Windows, the latter enhanced for Windows 95 and NT. Incidentally, the company name has recently changed from HSC to MetaTools.

KPT, like the host retouching applications, likes fast hardware. It will run on a 486 or non-PowerMac but particularly complex filters will benefit from a Pentium or PowerMac machine. The 16Mb of RAM and 16-bit or 24-bit colour displays come highly recommended, too.

Once specced up, you can look forward to one of the most unusual and attractive user interfaces ever. Ranges and options are enormous, but plain mucking about often produces the best results.

The most famous filters include the Fractal explorer, Texture and Gradient Designers, while new to version 3 and sure to become classics are the Spheroid Designer and the superb Lens f/x.

Within minutes of using KPT, you begin to realise just how many times you've seen examples of its work. There are few professional graphic artists that don't have KPT installed. Photoshop has never been so much fun!

Price £129 ● **Contact** Principal Distribution 01706 832000; http://www.metatools.com

DisplayMate for Windows

Ever thought your monitor isn't working as well as it could be? An educated eye can spot basic geometric distortions but can easily miss other aberrations. The result is a monitor not operating at its best resulting in possible eye strain for the user.

There are common images which reveal certain nasties straight away. Virtually all geometric distortions (where the image is anything other than a perfect rectangle with straight sides) can be spotted by displaying a spreadsheet. All those straight lines crossing the screen immediately show up problems.

Discolourations are another bane: that beautiful pure white image spoilt by a darkened patch in the corner. There's not a great deal you can do about discolourations other than remove offending nearby magnets, such as unshielded speakers. It is, however, very handy to be able to check out a monitor before you buy. Try maximising a window with a plain white background and the stains will show up.

This is all very well, but ever-so-slightly Heath Robinson. If you want a complete suite of images that will really test your display to its limits, look no further than Sonera Technologies DisplayMate. After two highly successful DOS versions, DisplayMate is back; this time for Windows. It was designed for Windows 3.x, but works fine under 95. DisplayMate for Windows comes on one disk and occupies just over half a megabyte on your hard disk.

DisplayMate tests for focus, geometric distortion, interference, registration, resolving power, and as the cliché goes; much, much more. A totally invaluable utility used by virtually every computer magazine for monitor testing.
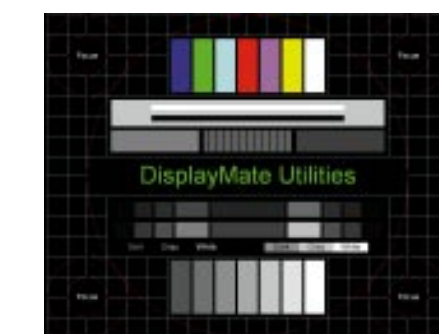
Price £69 ● **Contact** Meko 01276 22677; sales@meko.co.uk

110
PERSONAL COMPUTER WORLD
JUNE 1996

111
PERSONAL COMPUTER WORLD
JUNE 1996

System and diagnostic

WinProbe 4

WinProbe 4 is another systems performance and analysis package, designed to show graphically how your PC is performing and how you can improve it. It tackles both hardware and software problems, looking at what is and is not working in your configuration. The information is presented in the form of a series of graphs, dials and figures, making it easy for you to see the most important information about your systems, at a glance.

Some of the tests are similar to those offered in DOS and Windows, including a scandisk-type utility for looking at the surface of your hard and floppy disks as well as at their performance. It will test your soundcard, too, with a positively ear-splitting noise.

Certain of the tests are extremely revealing: for example, the chart showing exactly what is taking up how much space on your hard disk, or a detailed breakdown of your printer capabilities.

Other lists, such as those including which interrupts and addresses are currently being used, are invaluable if you are trying to slot in a new device but suffering conflicts.

The other tests it carries out are a little more esoteric. You will need to be quite technical to reap the full benefit of much of the information. For example, the lists of address ranges under ROM area information may be beyond the ken of the average home user.

Included in the deal is a CD which can be used to diagnose any problems you may have with your CD-ROM drive and this also includes Cleensweep and Mosaic.

Price £49.95 ● **Contact** Quarterdeck UK 01245 496699; http://www.quarterdeck.com

Ram Doubler for Windows

During the past six months we've seen a lot of programs that claim to double your system's RAM without the need for extra hardware. Understandably, these have generated a great deal of interest but when it comes to the crunch, most fail to live up to the hype. RAM Doubler, from US-based Connectix, is the exception.

Currently available only for use with Windows 3.1, RAM Doubler actually does what it claims to do on the packaging. It allows you to have more applications open simultaneously as if you had a load of extra memory to play with. The program can be installed in just a few minutes and when you restart your machine you're ready to go.

The secret behind RAM Doubler is an advanced data compression algorithm that works in conjunction with Microsoft's own virtual memory system. The program compresses data in memory and concentrates its efforts on increasing the available System Resources.

Windows' System Resources are several small blocks of 64K which hold things like window text, dialogue information and so on for each program you have opened. Applications are supposed to clean out their stuff after use, freeing memory ready for the next program — if they don't, then resources can run out and you can't load any more applications.

Connectix is working on a Windows 95 version but concedes that Microsoft has done a splendid job with the basic set up. But for Windows 3.1 users, RAM Doubler is a must.

Price £59.95 ● **Contact** Partners in Europe (Connectix) 0171 622 3355; Web www.connectix.com

Powertoy

Powertoy is a collection of small but perfectly formed freeware enhancements to the Windows 95 interface. Written by Microsoft's Win95 team, although not officially supported, it provides a series of features that should really have made it into the OS as standard.

Possibly the most useful feature for the average user is QuickRes, which provides the ability to change both resolution and colour depth on the fly. When this is running, you can right-click on the bottom right of the taskbar and up will pop a menu of all available graphics modes. If you select a new mode, Windows will automatically update itself without restarting. QuickRes worked with all graphic cards tested when using bona-fide Windows 95 drivers.

Another handy gadget is FlexCD, a replacement for the standard audio CD-player controls. Again, accessible from the bottom right of the task bar, it provides a pop-up menu that lets you Play, Stop and Pause CDs. You can select individual tracks and display CD properties. It doesn't provide as many features as Microsoft's graphical version but it's a damn sight quicker and easier to use.

Other key parts of PowerToy include Xmouse, which instantly activates the window under the mouse pointer à la Xwindows, and Shortcut Target which lets you access the properties of a real file or folder from its shortcut. Very handy.

PowerToy is constantly being updated and may have improved further by the time you read this. The current version is available, on our free cover-mounted CD-ROM this month, for you to try.

Price Free (at present) ● **Contact** www.msn.com

Pccheck

Regular PCW readers will remember our story on fake cache which first broke in the March issue. It all started when PCW News Editor, Clive Akass, suspected fake cache on a motherboard which he had bought in a computer store on the Tottenham Court Road. The final proof was provided by our two X-ray pictures: one showing a real cache chip with all its internal circuitry and the other showing a blank, fake, cache.

It may seem a little extreme to X-ray the chips on your motherboard but fake cache is not easy to spot. A machine fitted with the fake stuff will lie to you on bootup, declaring its 256K of cache, just like any other PC, and if you take the lid off and look at the motherboard, you'll see a cache chip just the same as any other. The one thing you may notice is that your machine is running a wee bit slow — but then your machine could be running slow for all sorts of reasons.

So if you are looking around your local computer dealers for a new personal computer, how do you test the machine of your dreams for fake cache? The answer is in this simple utility, pccheck.exe. Merely run the executable file from the a: drive and it will analyse the hardware on the machine and tell you exactly how much cache it has.

This is an essential utility if you're about to buy a new machine and easy to get hold of from our *PCW* Web site.

Price Free ● **Contact** http://www.vnu.co.uk/hc/pcw/

Quarterdeck QEMM 8

So you thought all your memory problems were over when you installed Windows 95? Not so. DOS applications still need to run in conventional memory — the area between 0 and 640K — but much of this can be swallowed up by programs loaded from your autoexec.bat and config.sys files. Additionally, different applications require different types of memory — upper, expanded and extended memory — and unless you fully understand memory management it's likely that your system is not running at its optimum.

This is where QEMM comes in with its collection of memory management programs. By analysing your system, QEMM can determine its optimum memory configuration, freeing up conventional and first megabyte memory essential for running DOS and Windows applications.

In addition, QEMM automatically handles all your applications and makes different types of memory available when required.

This latest version includes new features for Windows 3.1 and Windows 95 including MagnaRAM, a memory compression utility, and FreeMeg.

Windows 3.1 uses the first megabyte of RAM to load applications but if other programs are running, "Not Enough Memory" error messages are often reported. FreeMeg prevents this by making this memory available. Once the program has been loaded, data which needs to reside in the first megabyte is returned.

MagnaRAM provides you with more available Windows memory so that you can run more programs and open larger files. By compressing data, both in RAM and on your hard disk, your system runs faster by minimising the need for slower virtual memory.

Price £79.95 ● **Contact** Quarterdeck UK 01245 496699; http://www.quarterdeck.com
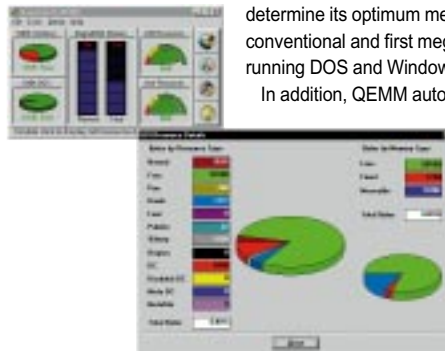
WINCheckIt 4.0

If you're brave enough to delve into the belly of your PC beast then you may need a trusty partner to help you along the way. Now you can team up with TouchStone Software's newest release, WINCheckIt 4.0, designed for Windows 3.1 and Windows 95, to help you out of any quandaries you might get into.

This "All-In-One Windows Problem Solver" is there to help you collect extensive data on your PC, troubleshoot problems, track system performance, test various sub-system components and more. One of the key features of WINCheckIt 4.0 is its ability to scan, compile and diagnose your system setup. Everything from IRQ settings, to TSR memory assignments, to BIOS data, is accessible through this utility.

WINCheckIt can also run benchmarks on your whole system, or a component such as your CD-ROM drive and give you a value for comparison. You are then able to save this information, along with any other system details gathered, for future comparison if you decide to change any of your PC system setup.

Another handy aspect of WINCheckIt 4.0 is the Uninstall and Clean and Zip functions. Both features are there to help you free-up drive space. Uninstall lets you select any program and delete it. Clean and Zip allows you zip (archive), move or delete unwanted files from your drive. Both these functions are particularly useful for those with older, lower-capacity hard drives. There is also Setup Advisor which gives you advice on device and adaptor card configurations, be it for current or future system setups.

Price £39 ● **Contact** TouchStone Europe 0181 8754444

Win '95 Advisor

The Touchstone organisation has a long track record in diagnostic tools but most of its products are aimed at the professional market. Win '95 Advisor, on the other hand, has been designed with the everyday user in mind. What does it do? It checks out your hardware to see if it's up to coping with the demands of Windows 95.

The program runs under Windows 3.1 and when launched proceeds to check your system from top to bottom. It tests various components and even performs a few multimedia benchmarks for good measure. If the program has anything to say, it comes back with a list of recommendations and compiles a report for you to read.

Win '95 Advisor has a well thought out design, with the overall score for your machine represented on a graphical dial. This is backed up by a one word evaluation such as Fail, or Wow! and oversized buttons on-screen make for easy navigation and the kind of interface that is unbreakable by idiots.

You can also run this program with Windows 95 installed and use it to fine-tune performance, although that's not really what it's designed to do.

There are some far more comprehensive diagnostic utilities around and the best of the rest are also in this round-up but Win '95 Advisor offers a cheap way to check your system before splashing out on a new operating system. In addition, TouchStone offers WinCheckIt 4.0 which provides a more complete solution.

Price £29.99 ● **Contact** Touchstone Europe 01442 862612

Norton Utilities '95

Norton Utilities became an essential for early PC users when it offered an easy way to undelete a file. Microsoft soon added an Undelete to DOS, and Norton — now owned by Symantec — had to find added attractions such as comprehensive system testing and repair.

Curiously, Win95 has brought Norton full circle because the new operating system's Recycle Bin will allow you to recover only files you personally delete, as opposed to what an application deletes. This means that there is no easy way to recover, say, a Word document that you close without saving — even though an automatic backup may be sitting on your disk.

Norton's bin purports to keep track of all deleted files and though it is not infallible it usually saves you from attempting a hairy DOS Undelete in the context of Win95's schizoid 16/32-bit filing system. Another bacon-saving feature is a rescue disk on which Norton records all your set-up data, which is normally held in your PC's CMOS memory. The loss of this information, perhaps because of a run-down battery, can lock you out of your machine. The Norton disk will instantly restore your data. It stores other system information, too.

These features alone are worth the price of the package, even if you only use them once. But there is a lot of useful icing on the Norton cake including system information and diagnostics, extended help, and disk repair.

Price £129 ● **Contact** Symantec 01734 814230; http://www.symantec.com

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PERSONAL COMPUTER WORLD
JUNE 1996

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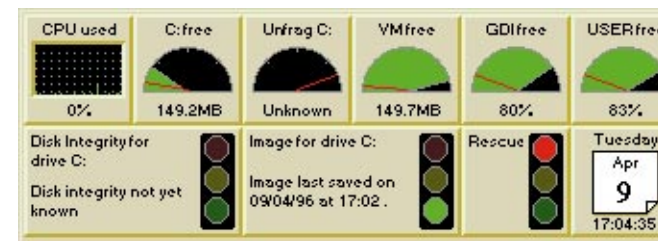
Norton AntiVirus for Windows 95

If you are using Windows 95 and need up-to-date virus protection for your home or business PC, check out Norton AntiVirus for Windows 95. The Windows 3.1 version of Norton AntiVirus wouldn't work in Windows 95 so Symantec went back to the drawing board and came up with a full 32-bit version.

It's an exhaustive anti-virus utility that will take up 6Mb of your hard drive but if you use a lot of floppies, or download information from outside sources, this could prove to be invaluable. It will automatically scan your memory and files on start-up and run in the background while you're working away. But that's not all it'll do. First off, you can use the Scheduler to run a virus check at specified times, either as a one-off event or on a regular basis. An additional bonus is that the Scheduler will launch a program at whatever specified time you may choose.

Then there is the extensive Settings menu that allows you to completely customise the scanning. You can select one, some, or all files for scanning; choose to autofix any problems; or track and record any activities that Norton performs.

If you find yourself in the unenviable position of having an infected PC before or after you've installed Norton AntiVirus you can use it's Rescue disk to remove the virus and if necessary repair any damage. Symantec provides monthly updates, too, via BBS, Web and on-line service sites such as America On-Line and CompuServe.

Price £79 (upgrade from Win 3.1 version is £29) ● **Contact** 01628 592222; http://www.symantec.com

Adaptec EZ-SCSI 4

The Small Computer Systems Interface (SCSI, pronounced scuzzy) was developed in the early eighties. SCSI, like IDE, is a bus which controls the flow of data (I/O), between the computer's processor and its peripherals, the most common peripheral being the hard drive.

There was a time when SCSI was considered a black art, with nightmarish installations and configurations. But Adaptec changed all that a long time ago with its range of SCSI cards and innovative EZ-SCSI software. You would just slot in your Adaptec SCSI card, connect all your SCSI peripherals and let EZ-SCSI do the rest. So long as there weren't any hardware conflicts, EZ-SCSI would seek out and correctly identify all SCSI devices, then install drivers for them and the card itself.

Time passed and faster, more sophisticated, SCSI standards arrived along with a wider variety of devices, local bus cards and 32-bit operating systems. Here, now, to meet these demands is EZ-SCSI 4, ready for Windows 95, NT, and 3.11, and the first from Adaptec to be optionally sold as a separate shrink-wrapped product. All Adaptec SCSI cards currently ship with EZ-SCSI 4, while the 1505 and 1515 cards have a light version.

EZ-SCSI 4 doesn't just install drivers — it is, in fact, no less than a full suite of 32-bit applications, tools and utilities that will manage and optimise all your SCSI hardware.

From backing up, to playing or writing CDs, from power management to read/write disk caches — even an online tutorial and performance benchmark — EZ-SCSI 4 really is the all-in-one solution for your SCSI peripherals.

Price £75 ● **Contact** Adaptec 01276 854500; http://www.adaptec.com

Microsoft Plus Pack

If you have Windows 95, the Plus Pack is a tempting buy. It's probably best known for its many and varied desk top themes which transform your desktop.

Not only do you get plenty of interesting back drops, but in addition each has fitting icons, cursors and sounds to go with it. You are able to combine any elements to your liking and even have a theme selected at random each time you load Windows.

But that's not all. In the Plus Pack you'll also find an Internet browser, a couple of pinball games, the System Agent and a splendid new welcome screen for when Windows is loading.

Getting onto the Internet couldn't be easier than with the Plus Pack. A Wizard guides you through each step and if you don't already have a service provider, you can sign up with the Microsoft Network. All you need is a modem.

The System Agent is a handy utility that loads each time you start Windows. It checks for low hard disk space and takes care of housekeeping chores by defragmenting your hard disk and running Scan Disk at set intervals. You can schedule programs to run during your lunch hour, every day, or just once a year. If you have a virus checker installed, or any other utilities, they can also be scheduled to run whenever you see fit.

When you get fed up with the Internet and animated cursors, you can try and beat my high score of 22 zillion on one of the two pinball tables!

Price £32

● **Contact** 01734 270000; http://www.microsoft.com

Inoculan for Windows 95

Virus protection for your PC is a good idea, especially if you regularly connect to the Internet and download files. Peace of mind can be obtained inexpensively with the new Inoculan for Windows 95.

It offers three forms of virus protection. An automatic checker, Wimmune, runs in the background looking for suspicious activity whenever you insert a floppy or download files.

Additionally, Inoculan allows you to check individual files, folders or whole drives on your PC or across a LAN via an intuitive File Manager-style window.

When you first install Inoculan it checks the memory to see whether any viruses are lurking there to give you trouble and it continues to do this every time the PC is booted. Any that are found are swiftly dealt with.

Despite its low price, Inoculan gives users a useful level of configuration. There are six methods of dealing with infected files. New, compressed, file extensions can be added to the list for checking and Inoculan can additionally be configured to work with Windows 95's System Agent — with this, you can set Inoculan to check for viruses overnight, for instance.

Right-clicking on individual files and folders will enable an instant virus check without having to open the file directory. In effect, this replaces Windows 95's own virus checker with Inoculan's superior level of diagnosis. Those whose PCs form part of a LAN (local area network) will appreciate being able to look at any file on the network and check it before accessing it.

Inoculan is an essential buy for those who wish to run virus-free PCs without hassle.

Price £45 ● **Contact** Cheyenne 01737 775500
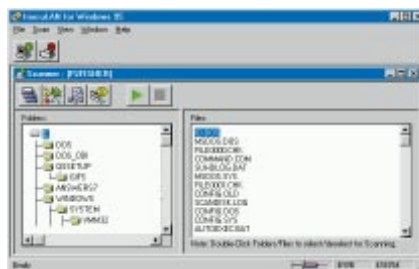
Programming

HS-Install

This shareware program is a mini development tool to help programmers put together simple functional setup programs. All the elements have been provided in this utility to make standard Windows 95, and Windows NT, install Wizards. Using Win32s, it will also work in Windows 3.1.

HS-Install is an interactive tool which is made easy to use by including its own set of Wizards which guide you step-by-step through the design process. First a Project Wizard asks for a title, a default directory, a directory for your files and a Desktop folder. As you work with the program, all your work is saved in a project file with an .HSI extension.

A series of icons labelled Steps 1 to 6 then guides you through the creation of your setup program, allowing the inclusion of a readme file, as well as your own customised logos, bitmaps, and help files. HS-Install will also allow you to configure your application to install as "Typical", "Minimal" or "Custom", and any alteration which you need to make to system files can be specified so that the autoexec.bat, config.sys and any .INI files will be modified accordingly.

The resulting setup program can take up as little as 80K, depending on your chosen options: a small overhead if you are trying to keep the number of installation diskettes to a minimum. Another useful function is the "uninstall" feature, which you can build into the setup program.

Price Free ● **Contact** http://www.dnh.mv.net:80/ipusers/harrisoft/

Origami

Over time, computer programs grow larger and the more complex they become, the more difficult they are to maintain. Even if your code is structured, or to some degree object orientated, you will still have this problem.

Origami is designed to help you avoid scrolling through pages and pages of code. It is a folding editor. Its purpose is to allow long pages of code to be folded into sections so that programs can be made easier to understand and maintain.
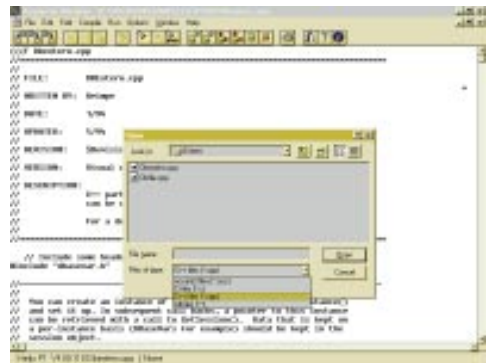
It extends the principle of tree structured directories into a text file.

Once a program has been carved up in this way, large amounts of text can be folded away behind the scenes under a descriptive heading and brought into view only when necessary. Using this technique, it is possible to ensure that no display exceeds a single screen at any time. Using descriptive headers for each section, this system eliminates the need for seemingly endless paging through long files of code to find the required section. With a tree structure in place it's easy to find your way around small sections of large, complex, programs while simultaneously maintaining a coherent picture of the whole.

Like most utilities of its kind, Origami can save you a lot of time but only if you use it intelligently. It's not an instant solution to unwieldy code but rather a tool which will help you to work more efficiently if you spend the time to use it well.

Price Free

● **Contact** http://www.windows95.com/apps/program.html

SocketSpy

SocketSpy is a tracing tool for programmers of PC COMMs systems and comes in both 16-bit and 32-bit versions, so you can use it under Windows 3.1, and Windows 95. It monitors Winsock API references between an application and the Windows sockets DLL.

SocketSpy/16 and SocketSpy/32 are both capable of monitoring and displaying all socket calls from an application under test in real time.

SocketSpy is easy to use. All you have to do is load it up and it will secretly tap into the messaging interaction between a user application and winsock.dll. As protocol messages are exchanged, they are duplicated and routed to a Trace Window for your perusal.

The great thing about SocketSpy is that it allows you to debug any Winsock API calls which you have made in your code, without you having to explicitly link it with the application under test. The resulting data on the SocketSpy display can be printed out or saved to a file. There's also a trapping facility which allows the display to toggle between the trace buffer and a trap buffer.

In addition, SocketSpy allows you to filter the resulting data by selectively enabling or disabling individual API calls — in other words, data can be restricted either to a specified socket or to only those API calls which result in an error condition. This works by accepting API calls from an application and forwarding control to the installed Winsock.dll while at the same time transferring copies of all passing data to the SocketSpy application for monitoring and display.

Price Free ● **Contact** http://www.windows95.com/apps/program.html

WinExpose I/O

This is a Windows 95 shareware utility which allows you to examine, in real time, which files each running application is using or trying to use. For troubleshooting, this applet is extremely useful. All file activities in each application and each different VM are traced, even those running in DOS boxes. So when you get an error message complaining that a particular .INI file is missing, you'll be able to locate it.

A collection of Input/Output filters allows you to specify exactly which operations you want to be traced so that you can narrow down the recorded activity when trying to solve a specific problem in Windows. The program is easy to operate: simply load it up and leave it running in the background while you perform other operations around the desktop. Every file operation that you perform in another application will be traced and logged in real-time on the Win-eXpose-I/O application screen. The resulting file can then be printed out and examined in detail.

If you're installing Windows software or just trying to make your current software work correctly, this utility could save you a lot of time. It can also give you some valuable clues if you're trying to improve the performance of your system. Leave it running in the background and it will let you know all the file seeking failures, allowing you to alter system settings to boost the performance of specific applications.

A valuable tool for experts and novices alike, and available for free download from the Web.

Price Free ● **Contact** http://www.windows95.com/apps/program.html

Internet and comms

Ameol

Ameol is an extremely useful utility if you're a member of the CIX online conferencing system. It helps you to cut your phone bills by automatically dialling up CIX, logging on using your CIX name and password, capturing all unread messages and logging you off again.

Within the CIX system there is a wide range of topics and conferences from which to choose, and if your interests are diverse it's easy to spend many hours online, running up huge phone bills in the process.

As well as being able to update all your conferences and mail messages in a flash (or in a "blink", to use Ameol terminology), the package also serves as a simple database manager. All unread messages are organised by topic and conference, allowing you to read each message one at a time or skip ahead to another conference. Topics can be arranged in order of interest so that Ameol always displays the unread messages of your favourite topic first.

Ameol helps you to use CIX more intelligently. Every function which you can perform using CIX online can also be performed from Ameol. Downloading files, for example, is done by specifying the name of the file and the topic in which it is located, or by downloading the file list which provides an index of all files in the topic. The next time you "blink", all the specified tasks are performed automatically.

You can download a copy of Ameol from the Web site below.

Price Free ● **Contact** Web site http://www.compulink.co.uk/cix/support/ameol/ CIX support line 0181 296 9666

Cyberspell

There are sections of cyberspace where misspelling seems to be *de rigeur*: a way of declaring how cool and unconventional you are. But what goes down well in alt.anarchy is not necessarily going to land you a job or a contract. And as email tends to be dashed off and sent without pause for reflection, mistakes can easily creep in even if you're a good speller.

Cyberspell, which comes in Win 3.x and 95/NT versions, brings spellchecking to the Netscape mailer. It loads itself, no messing, straight into Netscape from two floppy disks. The only sign of its presence is a Spelling option in the Message Composition box.

You are given a choice on the level of detail provided by the spell-checker: the most basic level flags unusual capitalisations, doubled words and hyphenation errors, as well as misspellings. A Powerspell option handles number formats and punctuation, as well as certain grammatical errors.

You can refer to a custom dictionary, too, and a standard Word dictionary is included. Cyberspell monitors how you respond to flagged words and if you leave one unchanged more than three times, it suggests that you add it to a custom dictionary.

Cyberspell lets you specify how many spaces you want to leave between sentences and you can tell it to ignore words with numbers, such as 455Mb. It is available for download on a trial basis.

Price £17.95 ● **Contact** Inso 0181 947 1122; Trial download www.inso.com

Netscape Navigator 2.0

Right now, this is probably the most famous piece of software in the world, and with good reason. Due to its enormous popularity (said to be used by around 70 percent of Web surfers worldwide) it is the browser in which third party Web developers are interested. This is why Netscape 2.0 users can enjoy real-time animations and sounds thanks to plug-in technologies such as ShockWave from MacroMedia.

Additionally, support for Java makes Navigator the most extendible browser around.

But other areas are probably more important. Navigator has unrivalled support for mail and newsgroup access through the browser window. With Navigator you can send email and browse newsgroups without ever using another application. And if you want to Telnet to somewhere else, well, you can do that too.

Navigator's use of Frames within the browser are unique. This makes viewing multi-page sites easier as the first page can be viewed as an index and second or third pages brought up within different panes in the browser window. Many Web sites are now taking advantage of this.

Another plug-in, Amber from Adobe, will make Web sites even richer by allowing full Acrobat PDF files to be displayed within the browser, complete with original fonts and images and live links to other Web sites. Using this, online magazines will come alive.

Still the king of Web browsers despite being pushed hard by Microsoft's own Explorer software, the only black spot is Netscape's ambiguous distribution and pricing policy. But if you like the Web, Navigator 2.0 is essential.

Price $49 (Free to non-profit organisations) ● **Contact** http://www.netscape.com

Norton PC Anywhere 32

If you have a portable and a desktop, or two computers in different places, PC Anywhere is an indispensable tool. It's much more than a simple remote control facility — you can use it to transfer files between two systems, or as an invaluable aid on a help desk.

As well as the modem and direct cable connections that you'd expect, PC Anywhere can connect to another system over a range of networks, including the Internet, potentially saving you a fortune in international phone calls.

It can also be used as an ordinary communications program for calling services such as CompuServe — though on a slow system you'll probably be better off using the Windows 95 HyperTerminal program.

Setting everything up is easy thanks to a comprehensive selection of Wizards that walk you through all the stages needed, but it's worth paying a little more attention to security because the defaults won't be suitable for people leaving their computers connected to a public network, such as the Internet.

Performance is pretty good on the whole, although not as impressive on a network as the performance on a serial link might lead you to expect. Even so, you can very quickly transfer files between two machines, and when you're doing remote control there are clever tricks that help speed things up, like the automatic replacement of wallpaper on the remote machine with a blank background.

If you need 32-bit remote control, you really can't do better than this.

Price £139 ● **Contact** Symantec 01628 592 320

LapLink for Windows 95

If you're a road warrior, constantly on the move and with a need to keep in touch with the office, then LapLink for Windows 95 could be just about the most useful utility you'll come across.
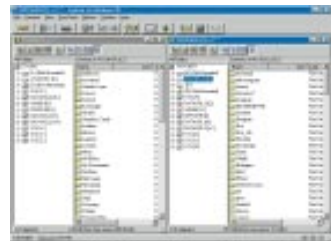
LapLink gives you three services for working with remote computers: Remote Control, File transfer, and Chat. Remote Control allows your PC to tap into and operate a remote computer as if it were in the same room as you. File Transfer allows you to exchange files from PC to PC. Chat provides you with an online communication tool for direct communication with someone working at another computer.

There's no real limitation on how the computers communicate with one another. You can link up via direct cable, infra-red transmission, modems, and networks. New to the Windows 95 version is computer-to-computer Internet accessibility, allowing the user almost unlimited alternatives for link-up.

But LapLink sophistication doesn't stop there. Features such as SpeedSync and Compression are what make it unique. SpeedSync allows the user to cut file transfer times (and hence save time and money) by comparing files before they are copied from one location to another and detects differences between them, if any. It then automatically updates the target file by sending only the changes that have taken place rather than send a whole replacement file. The file compression utility is additionally helpful in keeping communication costs down by minimising the time and size of file transfers.

Price £149.95 ● **Contact** Traveling Software 01793 818282; Web www.travsoft.com

Microsoft Internet Explorer 2.0

Windows 95 users now have a Web browser which is almost as good as Netscape Navigator and adds a few tricks just for them.

Internet Explorer (IE) has come on in leaps and bounds since it was bundled pretty much as an afterthought as part of the Windows 95 Plus! pack, and has outstripped its Mosaic-based origins.

Using IE, you can enjoy multimedia Web sites without having to download plug-ins. These include inline movies, inline sounds and scrolling text — all supported by Microsoft's extensions to HTML. You'll need plenty of bandwidth, of course, but that's the Internet.

With IE 2.0, Microsoft additionally supports TrueType display fonts within the browser, coloured text and coloured backgrounds for individual cells in tables. All are achieved through simple HTML tags.

Windows 95 users also enjoy one or two fancy tricks: right click any GIF image you like the look of and save it instantly as desktop wallpaper. Perhaps more useful is the way you can embed Web pages as shortcuts in Office 95 documents and click on them to open a connection to that Web page. These can also be saved in Exchange email files.

It's still a bit slower than Netscape Navigator and it can't yet do Java or ShockWave, but IE will only get better now that Microsoft has made the Internet its top priority and it looks like remaining free for the foreseeable future.

It is now also available for Windows 3.1.1, Windows NT and even Macintosh. Watch out for version 3.0, arriving soon.

Price Free ● **Contact** http://www.microsoft.com/ie

Milktruck Delivery

Without doubt, exploring the Web for information is becoming an invaluable part of our lives, especially if you are in business or education, but it costs time and money to keep returning to the same sites just to find they haven't changed.

Milktruck Delivery works with most popular browsers, including Netscape Navigator and Internet Explorer, by checking the sites you visit most for new material. This saves time and money. With Milktruck you only have to connect for the time that it takes to download new Web material from your favourite sites and then browse the full site offline.

Milktruck saves you the bother of having to trawl through the entire site to see whether the new information is worth reading. It also means that Web sites can be read on laptops or any PC that doesn't have a connection to the Internet.

Even if you have the luxury of a fast link to the Internet, Milktruck offers a better way of organising your bookmarks beyond that offered by most browsers.

Milktruck acts as a proxy server. The first time you launch you must choose which browser you wish to use. Milktruck launches the browser and serves up a number of HTML pages held in its own directory. All you do then is follow the onscreen instructions to organise your favourite sites and put them into pre-designated categories. These can be continually updated.

Once this has been done, you are ready to go onto the Internet for fresh delivery of new information.

Milktruck is a sophisticated yet simple way of getting the best from the Web without inflating your phone bill. There are similar packages available but none do the job as well or as stylishly as this.

Price Free (still in beta) ● **Contact** http://www.milktruck.com

Secret Agent

Here's another Web utility designed to make life a lot easier and less expensive. It performs a similar task to Milktruck Delivery in that it allows you to cache Web pages without reading them fully and then return to them offline and view them within Netscape.

Like Milktruck it uses a proxy server by storing the HTML on a local drive which is accessed, rather than the Web itself. It certainly saves money by keeping online time to a minimum, because you don't need to activate a TCP/IP link to the Web as normally happens when you launch Netscape. Instead, you cache sites to your bookmarks and read them from there. Links that have been cached within the site will work, too, but any external links will not.

This very compact package uses only one window and can be picked up in seconds, but there is an online help button if you get stuck. Your cached pages can be viewed in alphabetical or access order. A built-in search engine makes life easier if you are looking for an individual site, but it will only find keywords listed in cached URLs and not individual elements on those pages.

Unlike Milktruck, it will only work with Netscape but that shouldn't be a problem for many people and it can't update pages automatically. Other browsers may be supported.

For those who like to wander the Web yet still like to keep an eye on online charges, this is a good choice.

Price £24.95 ● **Contact** http://www.ariel.co.uk/sagent

WebEdit 1.3

Perhaps it's a slight misnomer to include WebEdit in a survey of 50 top utilities, because it does a lot more than most of the programs which masquerade as such. It's an HTML editor and, by general agreement, the best currently available. Many people despairingly resort to text editors like WordPad in order to write HTML because most of the commercial HTML editors are so clunky.

WebEdit, by contrast, is easy to use. If you prefer, you can still manually type in your tags, but you probably won't want to. For beginners, or part-timers, there's a Wizard which will churn out basic pages in double-quick time and includes support for background colours and additional features. Once you've generated the code, you can edit it or preview how the final page will look from within the program. For more advanced users there's support for form, table and maths tags.

The viewer in WebEdit can't guarantee to keep up with the latest stuff in the ever-evolving browsers. The programs preview gives it its best shot but you can also configure any other browser as a viewer. Thereafter, clicking on the spectacles icon lets you view your page.

WebEdit, like Netscape, uses the Internet as its means of distribution — it's extremely up-to-date. It was already implementing some of the features of HTML 3 before they'd reached Netscape or Internet Explorer.

The version we reviewed is 1.4C but beta versions of the 2.0 32-bit standard and professional versions are already available for downloading from Ken Nesbitt's most excellent Web site.

Price Free 30-day evaluation, then £26 ● **Contact** Grey Matter 01364 654100; http://www.nesbitt.com/

1 2 2
PERSONAL COMPUTER WORLD
JUNE 1996

1 2 3
PERSONAL COMPUTER WORLD
JUNE 1996

Archiving and compression
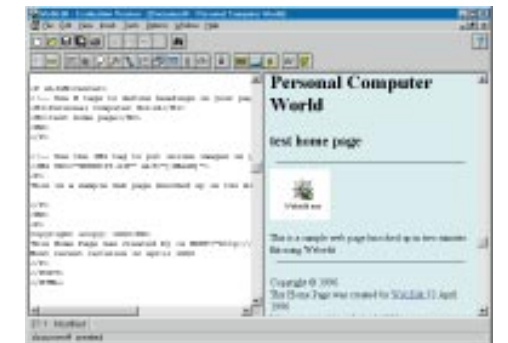
Winzip95

Pkzip is the most widely known and used compression utility for DOS, and its Windows equivalent, Winzip, has become equally popular. Not surprisingly, there's now a new version of the program for Windows 95.

This new incarnation of Winzip comes with the usual Windows 95 attributes. It's a fully 32-bit application, and it can handle long filenames. But the real improvements are in the integration with the Windows 95 interface. This version allows you to extract files from an archive by dragging and dropping them to a directory in the Windows Explorer, and you can view files by dragging them to an application on the desktop. Menu options have also been incorporated into the Explorer itself so that when you right-click on a zip file an "Extract To" option comes up in the context menu. Extra files can be added to an already existing zip file directly in Explorer without having to go back to Winzip and create the archive again.

On installation, Winzip searches for the virus scanning utility on your system and makes it available from the Actions menu, so that any zip file downloaded from the Internet can immediately be scanned before it is extracted. Virus scanning is an important function in Winzip, as one of the major uses for compressed files is for speeding up their transportation over the wires. This version is compatible with Windows NT as well as Windows 95. It's one of the most useful utilities you can have on your desktop.

● **Contact** http://www.winzip.com/winzip/winzip_x.htm.

ZRFileworks

Sending files across the Net is best done after they have been compressed. No-one wants to spend more time online than they have to, downloading files from the Internet.

The problem is that many email packages cannot handle compressed files on their own, and need a little extra help. That's where ZRFileworks comes in. Simply select the file within the application, choose the compression format and hit open. Then save it to the directory of your choice. Unusual or little-used file formats can be added to the list of files that ZRFileworks can deal with — the popular formats such as ZIP and UUEncoded are already built-in.

But there is more to ZRFileworks than just compression and uncompression. Files can be deleted, moved across networks and renamed. You can even run an anti-virus check on downloaded files.

The best part of ZRFileworks is that it is very easy to use, and even newcomers to the wonders of file compression should have little difficulty in expanding and compressing files ready for the Internet. Add to this the fact that you can view graphic files within the package, and even manipulate them before saving, and you have a powerful little application that far belies its shareware status.

Keep a copy of ZRFileworks on your PC and you need never be caught out by a compressed file again. Plus, if you register your copy you get two more modules to extend ZRFileworks still further.

Price $22 ● **Contact** jared10@aol.com or www.jumbo.com
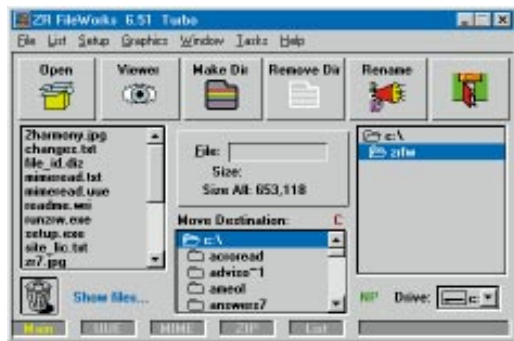
Stuffit Expander for Windows

There are two kinds of Windows 95 user. There are the ones who stick obstinately to the laborious Win 3.11 way of doing things, using file open dialogue boxes and Explorer, or even File Manager, wherever possible. Then there are the ones who embrace drag and drop with a vengeance. The second group spend most of their time using My Computer and open documents by dragging document icons onto application icons. This group will love Stuffit Expander. It's a stormingly successful Macintosh utility that's now been ported to the PC. It supports all the standard compressed file formats including .sit (which is the Mac stuffit format), .zip, .arj, .arc, .gz, .uue and .hqx.

If you put a shortcut to Stuffit Expander on your desktop, you can decompress files just by dragging a zip file onto it. Expander creates a directory with the name of the zip file (minus the Zip extension) and unzips all the files into it. You normally use Expander as an icon on your desktop. There's no need to preload the program unless you want to use some of the more advanced options such as configuring the destination of your decompressed files or deciding whether you want files to be decompressed into Windows or MacBinary format.

The only thing that Stuffit conspicuously doesn't do is create compressed files. I noticed that the author, Aladdin, is currently advertising for a Windows software ace on its Web site, so presumably it has such a product in the pipeline. In the meantime, you're still going to have to use something like Winzip.

Price Free ● **Contact** www.aladdinsys.com/
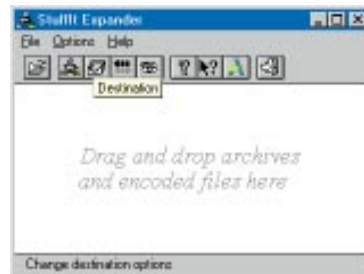
Wincode

Computers use 8 bits to a byte. They want to communicate using numbers up to 255 the whole time. Thanks to the history of the ASCII code, email only uses 7 bits at a time, allowing the computers to communicate with numbers of up to 127. With only 26 letters in our alphabet you can easily cater for codes for the full alphabet with room for numbers, upper and lower case, punctuation and a few other symbols within the 127 character limit. This is fine for sending text, but when pictures or programs have to be transmitted, or something which isn't raw text such as a spreadsheet or document file, the software will need to restrict itself to values below 127, making up for the missing information by sending one extra character for every eight of the small ones. The protocol for doing this is called uuencoding.

Wincode is a simple Windows utility which translates back and forth between 7-bit and 8-bit values. It understands the codes within a document. You use the Windows interface to select the file which needs to be converted, all with sensible browsing options, and Wincode turns files into their native format from .uue files and vice versa. You don't need to read any documentation, just know what you want to do. If you want to send files by email, particularly if you use the Internet, and your software doesn't automatically handle uuencoding, you need Wincode.

Price Free ● **Contact** www.wlyn.com/stroud/auxx/html#wincode

Application and file management
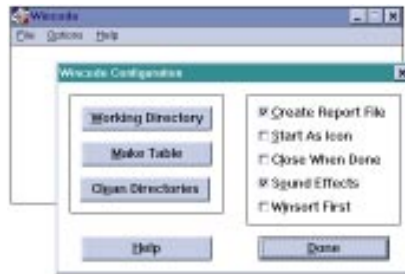
AFD Address Software

Just over a year ago, the Royal Mail made a complete listing of UK addresses and postcodes available on CD-ROM. It contains 600Mb of data in the form of 25 million UK addresses, 1.25 million business addresses and 1.6 million postcodes. This is all useful stuff for the average business, but it costs a hefty £445 for the basic version with an added yearly charge of £275 for annual updates.

The AFD Address Software utility uses the data from the Royal Mail's Postal Address File and puts it into a usable form at an affordable price. The great thing about this software is that it's not just a great big file of data; it actually comes with a whole host of application and development interfaces which allow you to link search routines into existing applications.

There's a whole load of sample code, too, written in various languages to help you integrate address-checking functions into applications built using Access, dBase, Paradox, Visual Basic and Delphi.

The basic standalone program will return most of an address when you enter any given postcode and it will perform the same routine in reverse. Enter an address or even a partial address, and all the valid postcodes will be returned for that street in that town.

AFD postcode software is available for DOS and Windows and you can get an evaluation copy of the software from AFD's Web site.
Price £154 ● **Contact** AFD 01294 823221;
Web http://www.afd.co.uk/index.htm
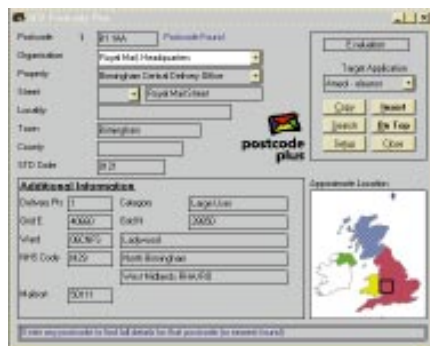
AskSam 3.0

AskSam is a lovely little utility, designed for those who get a sick feeling in the pit of their stomach each time they even think about building a database.

As it's a freeform database, there's no need for you to understand complicated structures or have a degree in computer science: you can begin to create a database as soon as you have loaded the product. You define your fields by typing in what looks very much like a word processing document. You enter the name of the field and follow it with a square bracket.

Allowing enough room for the data is just a question of keeping your finger on the space bar until you have sufficient characters. Data is then entered by typing in the spaces. As a freeform database the fields can be as short or as long as you want, including plenty of room for lengthy notes to yourself.

Searching a database you have created is just as simple. You hit the control key and type in any words for which you want to look. Searches can be boolean or multiple, which allows you a certain flexibility. You can then use the searches to compile reports.

AskSam is compatible with dBase, so for easier handling you can import other databases into AskSam. It has the usual mailmerge facility as well, so you can create form letters to send to all your clients at the press of a button.

It is available both in single-user and network versions.
Price £99.95 ● **Contact** Guildsoft 01752 895100

After Dark

After Dark, from Berkeley Systems, is a collection of weird and wacky screen savers which has passed through the *PCW* office on many occasions. The latest version, The Totally Twisted After Dark Screen Saver, is compatible with Windows 3.1, Windows 95 and the Macintosh, and is being marketed as "the sickest, most wacked out and absolutely outrageous screen saver you could imagine!"

This update to version 3.0 includes 13 extra animated modules with dozens of custom options, including the ability to combine six displays at once. Although I've always been impressed with the animations in After Dark, I have to admit that this latest instalment is a little on the sick side. One option, Frankenscreen, allows you to build grotesque faces, while another shows a stream of bunjee jumpers plummeting to their deaths. If this isn't weird enough for you, try taking a spin with a manic lawnmower man in a field full of cute cuddly kittens! Whatever happened to the innocent humour of a few flying toasters?

One of the more useful features in After Dark is its built-in power manager which will automatically shut down any Energy Star compliant monitor, saving you energy and money. It also includes a password protection facility which allows you to keep your PC safe while away from your desk.

Despite After Dark's recent psychopathic turn, this is still the best collection of screen savers on the market. The full product is available from most major software vendors.
Price Around £20 ● **Contact** Softline 0181 401 1234;
Web http://www.berksys.com/www/promotions/freeupdates.html
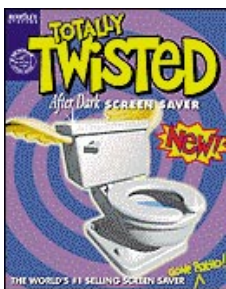
Avery Label Pro

Avery Label Pro is a utility designed to remove the angst from label printing. All the tools are provided for designing professional labels with text and graphics. Data can be imported from a variety of external sources including WordPerfect, dBase, Paradox, Word for Windows, Microsoft Word, and any other program that can export a delimited ASCII file. You can also create your own database from within Avery Label Pro using the List Manager provided.

If you do a lot of label printing you'll appreciate this utility. The Designer screen gives you full control over the positioning of fonts, allowing several horizontal and vertical positions as well as rotation. You can add your own bitmaps, too, in all sorts of formats including bmp, wmf, pcx, tif and gif. There are a few basic line-drawing tools for producing circles, squares and ellipses, and there's another utility for printing bar codes.

This is by no means a sophisticated program, but in a way that's its attraction. It's easy to use because it's not packed full of unnecessary functions and anyone can quickly get to grips with it. All kinds of label form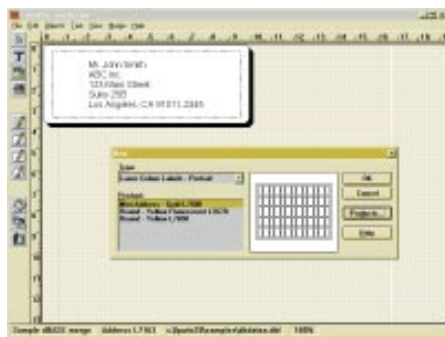ats are supported on a wide variety of paper sizes, and if you're ever unsure of what to do, there's a plentiful supply of well-presented online help.

Thoroughly recommended if you do a lot of label printing or print on A5-size paper, as there's an excellent variety of templates.
Price £49.95 ● **Contact** Avery Dennison Consumer Centre 0800 805020;
Fax 01628 764040

Gamma Unitype World

For typing in a foreign language, this utility is simplicity itself. Instead of requiring a dedicated word processor Unitype allows you to type in a number of different languages and typefaces, using your existing applications.

We looked at the World version which has 60 languages. This includes all the European languages in addition to many others, such as Tongan and Macedonian, but not Arabic or Oriental languages. There are other versions available which include more languages, as well as versions for specific language groups such as classical, biblical and scholarly.

The advantage of this package is that the chosen languages and typefaces can be imported into any kind of application so you can not only use it with your normal word processor, but also in databases, spreadsheets, drawing and DTP packages.

Unitype is very easy to use. It can be launched when you are in an application and used for all, or part, of a document. So if you only need it to fill in half a dozen cells in Russian, you launch Unitype, choose the correct language and the right keyboard map, and the characters you type appear in Cyrillic script. You can then close down Unitype and continue, or leave it running quite happily in the background but reset to the typeface and language you are using in the rest of the document.

The advantages when using unusual typefaces are self-evident, but even when you only want to type, say, a few German characters it is worthwhile having to avoid the Alt and a three-figure number nightmare.
Price £99 ● **Contact** Lingua Language Services 01484 689494
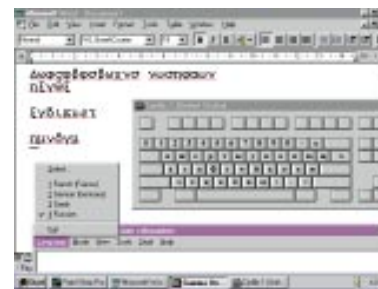
PowerDesk

PowerDesk is one of those utilities that some people say they can't live without. It's not just an ordinary Windows 95 add-on, but "the ultimate desktop enhancement" for Windows 95.

PowerDesk is actually two utilities rolled into one. The first part is made up of the PowerDesk Toolbar. This utility places your entire desktop, as well as many other features, into one location that allows you to have quick access to almost all facets of your PC. PowerDesk allows you to configure the toolbar to suit your needs. You can place applications, files, startmenu items and any kind of shortcut onto the toolbar. This helps you to avoid the seemingly endless layers of cascading menus when looking for an application or a feature. PowerDesk lets you just point and click to launch the program. You can also monitor your system CPU, memory or disk space on a second-by-second or minute-by-minute basis.

The second aspect of PowerDesk is ExplorerPlus. It is similar to Windows 95 Explorer in look and feel but is more versatile. It enables easier navigation through your drives, folders and files. Elements like the Drivebar remove the hassle of navigating through complex trees to get to your drive, which is very useful in a networked environment.

It also has a PkZIP-compatible archiving/extracting utility as well as a File Viewing utility for easy viewing of file contents without the need to open the related application. This is a versatile utility that does, indeed, make using Windows 95 easier.
Price £49.95 ● **Contact** MicroHelp 01703 814822; Web http://www.cmm1.com

Norton Navigator

Norton Commander was a popular and useful DOS product created in an era when any kind of GUI file management system was gratefully received. These days, the concept is harder to justify but the company has nevertheless released Norton Navigator, a file management system and alternative front-end for Windows 95.

Navigator is more than just a tool for copying, deleting, and moving files. It also contains utilities for zipping and unzipping, uuencoding and decoding, and encrypting files as well as a Fast Find searching tool which allows you to locate documents by searching for text strings. The File Manager provided with Navigator is a tabbed dialogue box providing a selection of file views, a default view in Explorer format, an old-style File Manager-type view, and an icon view. The fourth tab displays deleted files.

Despite a few useful features, the main thrust of Navigator is not to provide new tools. Most of the functionality in the software serves merely to duplicate already existing features in the operating system but more annoying is the way in which Navigator arrogantly takes over your desktop, promising to provide you with an easier way of working. Both of my working folders disappeared on installation, thus denying me access to all of my day-to-day applications and forcing me to use the new, "better", Norton method.
Eleanor Turton-Hill
Price £72 CD-ROM; £66.95 Disks; £40 upgrade from Win 3.1 (all street prices) ●
Contact Symantec 01628 788580
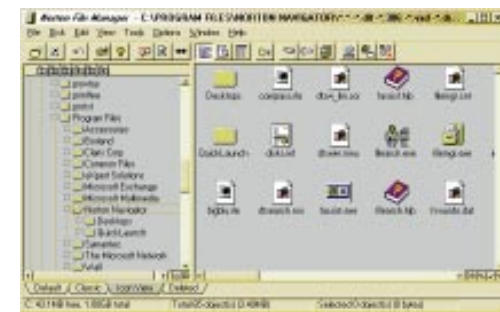
Sidekick 95

There is a difference between a Personal Information Manager (PIM) and a Contacts Manager. The latter is essentially a database for contact details, whereas the former relates to you, the address book being only a part of several utilities including a diary, to-do list and appointments scheduler.

Although Microsoft Schedule+, which comes bundled with Windows 95, will do everything most people (and especially home users) will want, Sidekick 95 is the best PIM for the more demanding user.

The address database is simple and excellent. You can easily modify part or all of it to suit specific needs and it is easy to copy address details across to other documents, such as a letter, in your word processor. You can also insert them directly into a prepared letter template in Sidekick's own "write" module. This is now a mini word processor, allowing you to select any of your installed fonts, employ bold and italic text effects, underlining and bulleting, and even change the text colour. There's also a spell-checker.

Apart from the address database, Expense View provides a simple yet powerful way of recording and organising your travel expenses and printing an expense report.

There is a full graphical map with real-time clocks for any eight of 370 world capitals and commercial centres. And there is a reminder page for scheduling appointments and listing to-do items.

Sidekick can dial the phone for you and provides an area for you to log conversations and documents, yet it isn't top-heavy and takes up less hard disk space than Lotus Organiser.
Price £39 ● **Contact** Starfish 0181 875 4455

Application and file management

Uninstaller '95

You would expect computer journalists to recommend Uninstaller, given that we so frequently load and unload packages for review. But any long-time PC user has faced the problem of watching a hard disk become clogged by bits and pieces of long-forgotten packages.

Even worse, drivers lurk unused in scarce memory, loaded by obscure lines placed in your configuration files by some shareware program you tried and discarded back in 1965.

Uninstaller is not an instant solution to this problem. It is meticulous in tracing which files and configuration lines relate to which packages, and obsessive in its precautions against deleting necessary files.

It demands from you the same detailed attention: you are allowed a veto on each deletion and have the option of making a compressed backup which you can eliminate when you are sure that files are not needed, which is all as it should be.
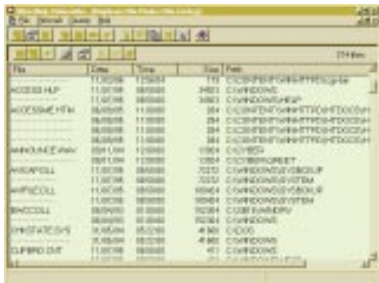
The basic uninstall functions have been much copied in rival packages but developer, Microhelp, provides a number of added features. A particularly useful one lists duplicated files, such as drivers, sitting in both the application and system directories.

Uninstaller also allows you to move applications between disks. This is not a trivial task with most Windows packages because of the need to update file pointers.

The feature may encourage piracy (easier to download that office application to your laptop) but it is legitimately helpful when you are shuffling files after a hard-disk upgrade, say.

Price £49.95; upgrades £19.95 ● **Contact** Microhelp 01703 814822

Dashboard 95

It's fair to say that Dashboard appeals to the kind of people who add extra headlights to their cars, or titanium bottom brackets to their mountain bikes. It's not strictly necessary but it does give your desktop a distinctive look. It adds controls, gauges and accessories which, although not helping you to work more efficiently, at least allows you to have the illusion.

For example, there's a graphical display of CPU usage, a readout of how many concurrent execution threads are operating and the number of VMs (virtual machines). There's a clock/calendar panel which, in addition to giving you a permanent readout of the time and date, lets you set alarms that can launch programs or remind you of appointments. And there's a games panel with a choice of a fruit machine, poker, or a slide puzzle, although the concept of playing for notional money dished out by Dashboard quickly palls.

The real heart of Dashboard, though, is its management of programs and document files. Along the top of Dashboard, tabs represent program groups from Windows 3.1 and programs in the Windows 95 start menu. Click on one and they drop down as menus. At the bottom, Dashboard organises your programs by category into Finance, Utilities, Multimedia and so on. Documents can also be launched straight from Dashboard.

The program makes extensive use of drag and drop. Documents can be dragged straight onto the printer icon and the tabs at the top can be rearranged in the same way. The whole program is fully customisable and makes extensive use of the right mouse-click to do so.

Price £39 ● **Contact** StarFish 0181 875 4455

Xtree Gold 3.0 for DOS

DOS lives, whatever Microsoft says about Windows 95 and the graphical interface. Millions of DOS-only PCs are still in use, because they are perfectly adequate for the purposes for which they were bought.

So there remains a demand for Xtree, the most successful of the packages that evolved to facilitate PC housekeeping under DOS. Significantly, it is a favourite among professionals, who still do much of their development work in a DOS environment.

Its features are too many to detail here but even its basics make life with DOS more bearable. It allows you to easily copy, move, undelete and view files, or change their attributes (from read only to read/write, say).

A comprehensive viewer includes a hex mode which allows you to read a file byte by byte.

A split-screen mode shows two disks or directories at once, allowing you to shuffle files between them, and you can search a set of tagged files (which can extend to an entire disk) for a text string.
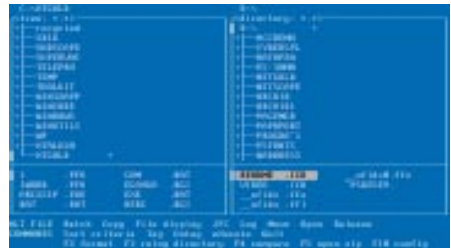
XTGold 3.0 is used even by Windows 3.x users because it is faster than the Windows version (having no graphical overhead) and more versatile than File Manager.

You can run it under Windows 95 but at your peril: 32-bit systems don't like 16-bit file managers digging too deeply. In truth, there is no point: Windows 95 does just about everything XTG does and more elegantly. But to a DOS user, XTG can become well-nigh indispensable.

Price £74.64 (£326.53 for five users) ● **Contact** Symantec 0171 835 1001

Telepower Pro

This is among the cheapest of a new breed of programs providing an affordable national phone directory on disk — a form which has long been outrageously overpriced by British Telecom.

Actually, Telepower Pro is only a business telephone directory but that means it will cover most official needs of most small businesses. At the price, a single-user version could quickly pay for itself in saved DIR calls.

The data sits on a CD which installs an access program on your hard disk. When summoned, this throws up a dialogue box which allows you to narrow your target area to a county, or district, or postcode. A countrywide search is possible and particularly useful for businesses as you are less likely to know where they are based — you would be hard put to get a DIR operator to perform one.

Telepower Pro also gives you a useful national and international dialling-code directory. You cannot dial from within Telepower Pro but a number can be pasted into a dialler, including the one supplied with Win95.
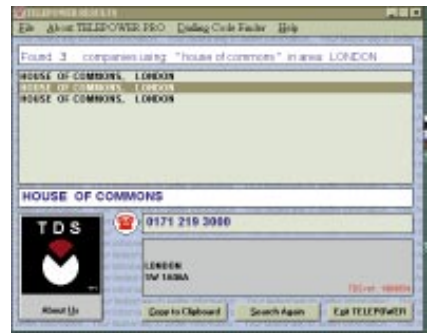
The package also comes in a networked form. You load it onto a networked CD drive and are allocated a password allowing access by however many users you have bought licences for.

If you anticipate very heavy usage you can transfer the files to a hard disk. But the speed from a quad-speed CD drive is acceptable and certainly quicker than phoning DIR.

Price £39.99; network prices start at £399 for ten users.
● **Contact** TDS 0345 697630

Top Mac Utilities

RAM Doubler

RAM Doubler has become something of a legend in Apple circles. It works with both 68K and PowerPC-based machines and is considered a must-have by just about everyone using a Mac on a day-to-day basis.

As with the Windows version, RAM Doubler does exactly what it says it's going to do on the packaging: it lets users have more programs open simultaneously by using advanced data compression techniques to squash data in memory when it's not in use. This on-the-fly compression has a processor overhead, but the overall difference in system speed is barely noticeable in all but a few applications.

Another benefit specifically for PowerMac users is that RAM Doubler decreases the amount of physical RAM needed to run fast, PowerPC native applications. This is because the PowerPC can then load code written in its own RISC instructions in fragments as and when it is needed. The difference in memory requirements can be quite dramatic — RAM Doubler reduces the amount needed to run the PowerPC version of Microsoft Excel by over six and half megabytes. Turning on Apple's Virtual Memory in the Mac's Memory Control Panel will have the same effect, but the drop in system speed is ridiculous.

Price £59.95 ● **Contact** Partners in Europe 0171 622 3355; www.connectix.com

Stuffit Expander

In the same way that PkWare's ZIP has become the standard method of file archiving and compression on the PC, the Mac world has adopted the Stuffit format. Written by Aladdin Systems, Stuffit Expander lets you quickly uncompress these and other files.

To use Stuffit Expander you just drag your archived file and drop it onto the application's icon. Simple. If all goes well, a few seconds later, a small dialogue box appears and a progress bar fills up as the files are decompressed. On its own Stuffit Expander supports the popular Mac formats .SIT, Compact Pro and MacBinary, but when used in conjunction with Aladdin's DropStuff with Expander Enhancer, will also deal with .ZIP, .ARC, Applelink PKG, BinHex HQX, and Unix Gzip. In addition, you can use Stuffit Expander to join together files that have been split over several disks with Stuffit.

Stuffit Expander is pretty much automatic, but has a few preference options that allow you to do things like automatically delete archives after expansion, and continue to expand a set of nested archived files. You would use the later to expand a Stuffit file that has also been uuencoded, for example.

Stuffit Expander has become a godsend in the *PCW* office, and once you get hold of a copy you'll never want to be without it again.

Price Free ● **Contact** Aladdin Systems www.aladdinsys.com

Speed Doubler

Another award-winning product from Connectix, Speed Doubler improves the overall performance of your Mac or PowerMac. It's available on its own, or as a bundle with RAM Doubler for £99.

Speed Doubler comprises three system extensions: Speed Emulator, Speed Access and Speed Copy. The first is perhaps the most interesting, but is designed only for use with PowerMacs. Speed Emulator is Connectix' own version of Apple's Motorola 68LC040 emulation software, the part of the Mac OS that allows PowerPC machines to run software written for older models. Connectix claims its emulator is twice as fast as Apple's because it uses pre-compiled instruction techniques rather than interpreting and converting 68K code into the PowerPC code every time it sees it.

Speed Access is an improved disk cacheing system which greatly increases the speed of applications that constantly access the hard disk, including the Finder and Doom2. Speed Copy is an enhanced file copying routine that can work in the background.

It got off to a shaky start, but Speed Doubler is now another must-have Mac utility. Be warned — you should use only Version 1.1.2 or higher, as earlier copies of Speed Access had a bug that could result in hard disk corruption. Users of older versions can download a patch from the Connectix Web site.

Price £59.95 ● **Contact** Partners in Europe 0171 622 3355; www.connectix.com

Norton Utilities

When it comes to system maintenance and diagnostic tests, the Norton Utilities from Symantec has no equal. Packed with features, it's definitely the best first aid kit you can get for the Macintosh. Period.

Norton's on the Mac comprises six main programs: Disk Doctor, UnErase, Volume Recover, Speed Disk, Norton Fastback and System Info. There are a few other useful bits including Disklight, which shows when the hard drive is being accessed, and the disk duplicating program, Floppier.

By far the most important is Disk Doctor, which functions identically to the Windows version and has averted many a hard disk disaster in the *PCW* office. UnErase is obvious and Volume Recover deals with drives that have really gone to pieces.

The two parts most likely to be used by everyone are Speed Disk and Fastback. Running Speed Disk every month is a great way to keep your hard drive fighting fit, unfragmented and ready for those essential Doom sessions.

Fastback is what you need to back up those all-important saved games. Backing up your work is also a good idea.

Finally, System Info can be used to check your system's performance against various standard configurations.

Price £99 ● **Contact** Symantec 01734 814230

ResEdit

Utilities that let you poke around the innards of an application aren't something the average Mac user wants to get involved in. Most Mac types like to use programs productively, rather than delve into what makes them tick. ResEdit is the exception to the rule.

Designed by Apple and now on version 2.1.3, ResEdit is an application resource editor. It lets you open up anything, from Adobe Photoshop to System 7.5, and peer inside at the bits that make it work. Resources are shown as categories depicted by icons, and double-clicking on these brings up various editing screens. Resources range from icons and dialogue box contents through to actual code and internal preference settings.

ResEdit can be used with Aaron, the shareware extension that makes the MacOS look more like Apple's up-and-coming Copland operating system. If you open Aaron in ResEdit you can adjust its display settings to suit your own taste. ResEdit can also be used to fix a bug in the current version of Adobe Photoshop which prevents drag and drop operations with non-Photoshop files.

ResEdit isn't something you'd use every day unless you're a programmer, but it's a damn handy thing to have on your hard disk.

Price £13.50 with the ResEdit Reference, or free download from the Web site shown ● **Contact** Full Moon Software 01628 660242; http://www.bekkoame.or.jp/~ykray/

The best of both worlds

The 166MHz chip is the fastest of the non-Pro Pentiums and will cope better with both 16- and 32-bit code. We review the first batch to hit the market.

LAUNCHED JUST SIX MONTHS ago, the Pentium 166MHz has quickly become the chip everyone is after.

The Pentium Pro is wonderful for 32-bit applications, but stalls badly over 16-bit code. The day we all swap over to pure 32-bit applications on the PC is still a long way off. Meanwhile, for as long as most people are still running a mixture of 16-bit and 32-bit applications, buying a fast Pentium now is still the way to prepare yourself for the demands of any future applications.

In this test of the first wave of P166s to hit the market, we did not specify a hard-and-fast configuration to the manufacturers concerned; we just requested the processor and left the rest up to them.

As a result, we received machines which

The Apricot IS550: a good business machine that clocked up a very respectable Doom2 score

varied from the consumer-orientated Dell to the high-end dual processor machine from Olivetti, running NT.

The results nevertheless give a good indication of exactly what a P166 is capable of and the kind of performance you can wrench from it. The other specifications are more subjective — it is up to you to decide what you want from a machine. We have therefore judged the machines purely on a price/performance basis.

Apricot IS550

The Apricot was certainly built as a business machine: the first thing that caught our eye when we took the top off was the very well-regarded 3Com Fast Etherlink PCI card, obviously intended for the network user.

Apart from the network card, all adaptors have been done away with. Instead, the sound and video operate from chips directly on the motherboard.

The video chip is from Cirrus Logic and the sound chip is the Vibra 16 from Creative Labs. This frees up valuable space in an otherwise rather small case. For serious multimedia purposes you might want to opt for a better sound card, but if you are looking for a consumer PC then this particular product is probably not the right choice.

Graphics performance does not suffer from being on the motherboard, and the Apricot clocked up a very respectable score at Doom2. This is a test we carry out as a performance marker for the graphics card and hard drive, as well as a test of how a machine copes with low-level applications.

The slots in this machine were all located on a riser card coming from the centre of the motherboard. This is a common design in machines of this nature and can be achieved either very cleverly or very badly. On this occasion, the Apricot seemed to have got the balance right. There was enough space to get at the single 3.5in free bay and full-length cards would be easy to fit in to the space available.

On the performance front the Apricot did well all round, clocking up healthy scores in all our tests. The Windows tests results were slower than those of the Dell and the Gateway, but were more or less in line with what we would expect to see from a P166.

There is no software included in the deal, just the basic operating system, which means added expense for the home user. But the only big disappointment was the monitor. This was a 15in model which could be pushed to 1,280 x 1,024 pixels at a pinch but it flickered like mad. Even running at 800 x 600, the resolution at which we run our tests, the picture was blurred and indistinct. It had very poor colour separation and jumped about badly as you came in and out of a full DOS screen.

PCW Details

Apricot IS 550
Price £2,474
Contact Mitsubishi Electrics 0800 212422. Fax 0121 7173549

Good Points Good low-level performance.
Bad Points Poor monitor. No bundled applications.
Conclusion A solid machine, but it didn't quite match the others in the test on either performance or price

Dell Dimension XPS 166S

When we received the new XPS 166S with a caution from the manufacturer not to expect great performance, we decided to take Dell at its word. With a new motherboard, new Triton 2 chipset and an Alpha BIOS, it was expected to do poorly. But it didn't. In fact, it out-performed the Apricot in our Windows 95 test.

The XPS 166S is Dell's latest addition to its Dimension line of PCs. Based on the Intel Terminator motherboard, it comes with the Intel 82430 VX chipset. As a result of this move to the new motherboard, much of the interior of the

The Dell comes complete with SDRAM and Triton 2

machine has changed. There are still three PCI, three ISA and one ISA/PCI slots for expansion cards, but there's a dramatic change in the make-up of the memory slots. Instead of the usual four 72-pin SIMM slots, there are now only two 168-pin DIMM slots which hold 16Mb of SDRAM. The use of SDRAM is a departure from Dell's normal use of EDO-

PCW Details

Dell Dimension XPS P166S
Price £2,149
Contact Dell 01344 720000; Fax 01344 723699

Good Points Nice new case, lots of interior room for expansion slots.
Bad points Still in Alpha BIOS stage, so it under-performs in DOS.
Conclusion Early indications look positive and they seemed to have beat their competition to market with the Triton 2 chipset.

RAM for its high-end PCs.

The sub-system was composed of a whopping great Western Digital Caviar AC32500 2.5Gb HDD, a Number Nine Imagine 128 (although it will come with a Motion 771) graphics card, a Teac CD-56E six-speed CD-ROM drive, 512Kb pipeline-burst cache, and an on-board Creative Labs Vibra 16S sound chip.

Externally, the case is different from earlier tower models. There are two spare 5.25in and three 3.5in front-facing expansion bays. To the rear, you'll find the expected PS/2, serial and parallel ports with the extra bonus of a joystick port and audio in/out jacks.

Because the Dell we reviewed was a prototype, it had an Alpha BIOS that hindered certain aspects of its performance, particularly in DOS. This can be seen in the Doom2 result. Otherwise, its better-than-expected performance bodes well for the XPS 166S and we look forward to seeing the finished product in June when Dell expects to begin shipping.

Gateway P5-166 Sovereign

True to form, the Gateway came in a huge case. The amount of free bays you get as a result is amazing: six 3.5in internal and two 5.25in front-facing — no problems if you want an extra hard disk, or two, or three.

On the Intel motherboard there was a CELP socket with 256Kb of cache and 16Mb of RAM in two of the four SIMM sockets. The slots were surprisingly limited considering all the free bays: just four PCI and three ISA (one is shared).

One of the PCI slots is occupied by a Matrox Millennium graphics card with a hefty 4Mb of WRAM. The Matrox is

1 3 4
PERSONAL COMPUTER WORLD
JUNE 1996

1 3 5
PERSONAL COMPUTER WORLD
JUNE 1996

The Galloping Gateway

Olivetti M6-690 DP Suprema

The Olivetti machine was just a little different from the others in the test. For starters, it was a dual-processor system with 32Mb of RAM, 512Kb of cache and a 1Gb SCSI-2 hard disk. This configuration is more suited to running an operating system such as Windows NT than Windows 95 and so that's how we tested it in the VNU Labs.

While the case is unlikely to win any prizes — our labs tester commented that it looked like the vented side of his microwave — Olivetti has crammed a lot inside. The dual processors sit on the edge of the motherboard with a Voltage Regulator Module. The RAM is in two SIMMs (one ordinary and one extended) which are underneath the bays. Included on the motherboard is an SMC chip and the machine can be hooked up to a network via a twisted pair connection.

A Matrox Impression video card and an Adaptec SCSI card, which connects the hard disk, project from a riser card and take up the only two PCI slots. There are two free ISA slots and two shared with the PCI slots. A Mozart sound card is located behind the riser card in a separate ISA slot. There's plenty of room for a full-size card in any of the free spaces.

regarded as one of the best video cards around today. It is fast, powerful and does not suffer from the compatibility problems associated with some other graphics cards.

The monitor, which has a 17in screen, is a Sony Trinitron, rebadged by Gateway as a Vivitron. It coped remarkably well, running at 1,280 x 1,024. It was stable, flicker-free and had good colour separation.

The multimedia functions were well catered for. There was a six-speed drive from Wearnes and an Ensoniq sound card (a reliable brand).

Performance-wise the Gateway fairly raced away. The Doom2 score was extremely good and the Corel score right up there with the best of them. It could not be faulted on the office applications. All in all, this machine was a performer.

Included in the deal is MS Office Professional 95, the last word in office software. There are no multimedia CDs included, but then, their value is always debatable.

Add all this together and you've got an extremely competitive package. Considering its staggeringly low price, you can't really go far wrong.

The dual-processor Olivetti wins no prizes for its looks, but there's a lot on the inside

Editor's Choice

Choosing between these machines was no easy matter: each was quite unique. The Olivetti is obviously a machine which should be considered separately as it was the only dual processor and the only machine tested with NT. Its performance and build quality was a little disappointing.

Of the remaining three, two stand out. Firstly, the Dell for being an innovative product. It is the first machine we have seen with a Triton II chipset and SDRAM. There are still teething problems with the BIOS, although these should be sorted out by the time it is in full production. Notwithstanding, it performed admirably and the price is hardly outrageous considering the new technologies that were included.

Secondly, the Gateway had to come out on top for pure speed and excellent price. If you are looking for a P166, you are looking for a fast mover, and the Gateway more than matches this criterion. It was a clear winner both in the Windows and Doom tests, suggesting good all-round component performance. Finally, its price is not to be sneezed at, and so the Gateway wins our Editor's Choice.

The bays were tightly-packed. A Sony 6x IDE CD-ROM drive sits on top with one free 5.25in bay beneath it and then the floppy drive and the hard drive at the bottom. Don't even think about trying to get down to this to replace it — we had to squint in at obscure angles just to find it.

When you consider that this is a dual-processor machine, the performance was disappointing. We had problems with it when it first came in and had to wipe the hard disk and reinstall NT from scratch. The performance results were compared with an Olivetti Pentium Pro 150 with 32Mb of RAM and running Windows NT. It is interesting to note that it did best on the Excel 7 tests, where the structure of the code is best suited to the dual processor architecture.

Adele Dyer & Dylan Armbrust

PENTIUM 166MHZ CHIPS TABLE OF FEATURES

Manufacturer and model	Apricot IS 550	Dell Dimension XPS P166S	Gateway P5-166 Sovereign	Oliivetti M6-690 DP Suprema
Tel no	0800 212422	01344 720000	0800 552000	0800 447799
Fax no	0121 717 0132	01344 723699	00 353 1 848 2022	01908 203464
Price (excl VAT)	£2474	£2149	£2029	£4459
Local bus architecture	PCI	PCI	PCI	PCI
Free local bus only slots	1	3	3	1
Free ISA only slots	3	2	2	3
Free shared local bus/ISA slots	1	1	1	1
Motherboard manufacturer	Apricot	Intel	Intel	Olivetti
Chipset	Triton	Intel 82430UX	Triton	VCSI
No of spare 3.5in bays	2	3	3	1
No of spare 5.25in bays	0	2	3	1
Hard disk manufacturer	Quantum	Western Digital	Western Digital	Seagate
Hard disk size	1.2Gb	2.5Gb	1.6Gb	1Gb
Hard disk interface	EIDE	EIDE	EIDE	SCSI-2
Main/Max RAM	16Mb/128Mb	16Mb/64Mb	16Mb/128Mb	16Mb/128Mb
RAM type	EDO	SDRAM	EDO	Parity Memory
SIMM type (pins)	72-pin	168-pin DIMM 3.3 volt	72-pin	72-pin
L2 cache/max cache	256Kb/512Kb	256Kb/512Kb	256Kb/512Kb	512Kb/512Kb
Cache type	Pipeline Burst	Pipeline Burst	Pipeline-Burst	Pipeline-Burst
CD-ROM	Sony CDU-77E	TEAC CD-56E	Wearnes	Sony CDU-76E
CD-ROM speed	4X	6X	6X	4X
Sound card	Creative Labs Vibra 16	Creative Labs AWE32	Ensoniq SoundScape	Mozart
Graphics card	Cirrus Logic GD 5434	Number Nine Motion 771	Matrox	Matrox Impression
Graphics card RAM/max RAM	2Mb / 2Mb	2Mb VRAM	4Mb	2Mb / 4Mb
Graphics card max non-interlaced resolution	1280x1024x256 @ 75Hz	1600x1200x256@60Hz	1600x1200x256 @ 70Hz	1280x1024x256 @ 75Hz
Monitor	Apricot XJ54748	Nokia 447W D1728-TCO	Sony Vivitron	Olivetti DSM50171
Monitor size (in)	15	17	17	17
Monitor max refresh rate (1024x768)	75Hz	75Hz	80Hz	75Hz
Software supplied	Windows 95 or Windows 3.11	Windows 95, Office Pro 95	Windows 95, Office Pro 95	Windows NT 3.51 Workstation
Standard warranty	3 yrs — 1st on-site,	1 yr collect and return	1 yr on-site, 3 yrs parts (back to base)	3 yrs —1 yr on-site 2nd and 3rd yr return to base
Warranty options	2nd and 3rd return to base	Up to 5 yrs collect and return, upgrade to on-site service available	2nd and 3rd yr on-site	2nd and 3rd yr on-site
Telephone support	No	Yes	Yes	Yes
Fax support	No	Yes	Yes	Yes

Performance Results

VNU LABS EUROPEAN

Manufacturer Model

Windows 95

	Scores
Dell Dimension XPS 166S	2.36
Gateway P5-16 Sovereign	2.52
Apricot iS550	2.18

Scale: 2.0 — 2.2 — 2.4 — 2.6 — 2.8

Doom Scores

	Scores
Dell Dimension XPS 166S	5780
Gateway P5-16 Sovereign	2493
Apricot iS550	2527

Scale: 2.00 — 3.00 — 4.00 — 5.00 — 6.00

Windows NT ■ Olivetti Dual -P5 ■ Olivetti Pentium Pro 150

	■	■
Word 6	0.50	1.00
Word 7	0.62	1.00
Exel 5	0.89	1.00
Exel 7	1.24	1.00

Scale: 0.40 — 0.60 — 0.80 — 1.00 — 1.20

FASTER

Graphic detail

The overall picture in the world of graphics cards has changed in a year. We test fourteen of the finest to illustrate the point.

PCW Card Photography by David *Whyte*

Graphics Cards. Next to your processor, they're probably the most important part of your PC. A card with a reasonable amount of memory and well-written drivers can make all the difference to the overall performance of your computer. This is especially the case in the age of Windows 95 and its associated Graphical User Interface (GUI) intensive applications.

But the demands on graphics cards don't end there. With the ever-increasing move towards multimedia, video is playing a larger role on the PC than ever before.

In addition, we're seeing that old standards are giving way to new in the move from VLB and ISA bus interfaces to the PCI bus interconnect. Combine this with the evolution of graphics controller bandwidth from 32-bit to 64-bit and the use of different memory types, and we have a whole new universe unfolding before us with new "species" of graphics cards. Faster cards, greater colour depths and more video playback are the result of the evolution.

GRAPHICS CARDS
CONTENTS

For this year's *PCW* annual graphics cards group test we take a look at the new breed of cards to see who's where on the evolutionary scale of things.

Looking back a year you'll see that some, such as Samsung, have become extinct in the graphics-card business, while others have melded together like Spea and Diamond Multimedia. The result is a more diminished field of players.

To separate the weak from the strong we asked fourteen suppliers to provide us with their newest set of graphics cards. Our spec was fairly simple: they had to be PCI plug-and-play based cards with a minimum 2Mb of memory, Windows 95 compatible and cost less than £500. We also managed to get a sneak preview of two cards, the Orchid Kelvin Video 64 and the Paradise Pipeline 64, that haven't been released yet. Plus, we take a quick look at three PCI graphics cards for the new PCI PowerMacs.

Over the next twelve pages you'll find 14 PCI PC graphics cards varying in price from £89 to £339, with performance differences just as wide, giving you an overview of what's out there. Read on to see who is the fittest and who takes our Editor's Choice.

Dylan Armbrust

150
PERSONAL COMPUTER WORLD
JUNE 1996

151
PERSONAL COMPUTER WORLD
JUNE 1996

ATI Video Xpression

When a graphics card arrives in a plain white box with no markings, one shouldn't expect much. However, after our test results came back we found ATI's Video Xpression almost blew away its competition. Surprising, since this 2Mb card, based on the Mach 64 264VT chip, uses standard DRAM, not fast EDO or VRAM like many other manufacturers.

A quick glance at the results and you can see the impact of ATI's well-written drivers, as well as its chip technology. Our tests show that the ATI was particularly strong on graphics primitives and the applications component at 800 x 600 in true colour.

The ATI Mach 64 264VT, successor to the Mach 64, incorporates a 135MHz RAMDAC as well as video acceleration. Oddly, the ATI's performance in our video frame drop test shows a weakness, most likely in the drivers, in video playback as it was one of the few cards to drop frames in both video tests.

The Video Xpression manages resolutions and colour depths of 640 x 480 at 32-bit, 800 x 600 at 24-bit, 1024 x 768 and 1152 x 864 at 16-bit, and 1280 x 1024 at 8-bit. It also provides for maximum resolution and refresh rate of 120Hz at 1024 x 768 but only while running at 4 and 8-bit colour depths. Anything higher and the refresh rate dropped below 72Hz. This was disappointing considering that many other cards could support better refresh rates at higher colour depths. Forgive this, and you've got a fast and affordable card.

Details

ATI Video Xpression
Price RRP £175 (street £129)
Contact ATI Technologies 01235 833666.
Fax 01235 833668

Good Points Speedy and affordable.
Bad Points Refresh rate at high resolutions.
Conclusion A good card that combines impressive speed with a good price.

Scores					
Usability					4
Documentation					4.5
Utilities					4.5
Value					5

Cirrus Logic 5446

This tiny card is a bit of an anomaly in our group test because it's not actually for sale. What we looked at is the graphics accelerator, the CLGD 5446, and what it and its accompanying generic drivers can do.

You can expect to see this chip on several OEM boards, such as one from Creative Labs, in the near future.

The board provided was a PCI and VAFC bus compliant card that had both a VESA and Video Media Interface (VMI) feature connector. The VMI connector is an open standard that will allow MPEG and TV-related add-ons to be attached to the card.

The screen quality and colour provided by the sample card was excellent. No artefacts, glitches or fuzziness were found. In terms of refresh and resolution the chip held its own when compared to the rest. With a maximum resolution and refresh rate of 1024 x 768 at 85Hz it easily provides flicker-free images. The range of colour depth is pretty much standard with 16 million colours available up to 800 x 600 resolution; 65,535 for 1024 x 768 and 256 for 1280 x 1024.

Installing the card went smoothly and Windows 95 picked up the hardware first time round, prompting the user for the driver disk. Because it is only a sample card, there was no consumer-orientated documentation to speak of. However, the generic drivers provided by Cirrus Logic include utilities that integrate into the Display Settings menu to allow for refresh rate change and on-the-fly resolution changing.

Details

Cirrus Logic 5446 Visual Media Accelerator
Price N/A
Contact N/A **Phone** N/A **Fax** N/A

Good Points Good performance at 800 x 600 resolution in 16 million colours.
Bad Points It's not for sale.
Conclusion Should do well.

Scores					
Usability					6
Documentation					2
Utilities					3
Value	N/A				0

Diamond Stealth 64 2201XL

At £115 the Diamond Stealth 64 Video 2201XL is one of the cheapest 2Mb EDO RAM graphics cards on the market. This half-length card is, like most of the others, based on the S3 Trio 64V+ chip. Little in terms of design sets it apart except for its drivers and utilities.

The Stealth 64 Video's performance was a bit of a disappointment with artefacts cropping up on the screen and scores placing it in the middle of the pack. However, its In Control utilities were the best on offer from any manufacturer. Supplied with Diamond's new GT set of drivers, the In Control tools allow for on-the-fly resolution and colour depth changing, zoom, and virtual desktop settings, all integrated into the right-click function of your mouse.

The Stealth 64 Video can support a maximum resolution of 1280 x 1024 at 256 colours with a steady refresh rate of 75Hz. The card is ideally suited to the average home user with a 15in monitor as it supports a maximum non-interlaced refresh rate of 120Hz at 800 x 600, giving the user a rock solid image if the monitor can handle it.

On the card itself there is a LPB feature connector for an MPEG add-on card (available for an extra £88) but no more space for memory upgrades; 2Mb is the maximum. The card has drivers for Windows 3.1x, Win95, Microsoft NT, AutoCAD and OS/2. If you want a respectable graphics card at a good price, this is worth looking at.

Details

Diamond Stealth 64 Video 2201XL
Price £85 (1Mb), £115 (2Mb) street price.
No RRP available
Contact Evesham Micros 01386 765500.
Fax 01386 765354

Good Points Great set of utilities.
Bad Points Not the fastest of the cards here.
Conclusion An average card at a good price.

Scores					
Usability					4
Documentation					4
Utilities					5.5
Value					5

Diamond Stealth 64 3400XL

The Stealth 64 Video 3400XL was one of the hit-and-miss cards of the group. It performed very well on our application tests, especially at 1024 x 768 in 16-bit colour, but it failed to live up to expectations in some of our other tests, particularly when operating at 800 x 600 in true colour.

Like its junior, the Video 2201XL, it uses the new GT drivers and draws its versatility from the In Control utilities. Along with the expected on-the-fly zoom and virtual desktop settings it comes with some unexpected resolution settings. With 4Mb of VRAM one would expect it to reach a maximum of 1600 x 1200 in 16-bit mode, but Diamond has included an additional setting of 2048 x 1536 at 256 colours! Like Matrox, it appears Diamond, too, has big ambitions for this card.

With an IBM 220MHz RAMDAC and S3 Vision 968 chip, this card can provide flicker-free vertical refresh rates up to 76Hz at 1600 x 1200 while the maximum resolution at maximum refresh is 1024 x768 at 120Hz. Along with drivers for Win95, Win 3.1x, NT, DOS, CAD and OS/2 Diamond has bundled a fair amount extra software. The extras included are MPEG Arcade, Video for Windows, 3DFX and CorelDraw 4.

The end result of all of these features is a sturdy graphics card that copes well with application graphics, video-file playback and DOS-based games like Doom2. If you're willing to spend a bit extra then take a look at this one.

Details

Diamond Stealth 64 Video 3400XL
Price £189 (2Mb), £289 (4Mb) street price.
No RRP available
Contact Evesham Micros 01386 765500.
Fax 01386 765354

Good Points Lots of range with its 4Mb of VRAM. Good software bundle.
Bad Points Inconsistent performance in tests.
Conclusion We expected better performance, but you wouldn't suffer with this card.

Scores					
Usability					4
Documentation					4.5
Utilities					5.5
Value					4

Hercules Terminator

Yet another S3 Trio 64V+ chip crosses our path, and when this happens we have to look at what make the card different. In the case of the Graphite Terminator, it would have to be the drivers and the price. We used the latest release of Hercules drivers, only to find they only slightly improved performance over earlier versions. As for cost, the official price is £215, the third highest in the group (street price is roughly the same).

This half-length card comes with a maximum of 2Mb of EDO RAM and can support, like most S3-based cards, resolutions of up to 1600 x 1200 at 256 colours. Maximum colour depths of 16 million colours are achieved at resolutions of 640 x 480 and 800 x 600, while 65,535 and 256 colours are supported at 1024 x768 and 1280 x 1024 respectively.

The Graphite Terminator 64 Video may not be the fastest card in the group, but it did handle the video component of the test well. It dropped the second fewest frames on the 800 x 600 test and no frames at all on the 1024 x 768 test. It also has a dandy set of utilities. Its Touch 95 utilities incorporate on-the-fly resolution and refresh rate switching, as well as zoom and virtual desktop. And if you want an alternative to the Windows 95 multimedia player you can make use of the Hercules Entertainment Centre. The Graphite Terminator also comes with the full range of drivers except for AutoCAD.

Details

Hercules Graphite Terminator
Price £215 (2Mb)
Contact Imago Micro 01635 861122.
Fax 01635 868188

Good Points Good utilities and high-resolution capability for 2Mb card.
Bad Points Expensive compared to the other S3 Trio 64V+ based cards.
Conclusion The straggler of the group and a wee bit overpriced.

Scores					
Usability					4
Documentation					4.5
Utilities					5.5
Value					4

Matrox PowerDoc

This Canadian import is currently one of the most sought-after graphics cards on the market, solely aimed at the business and SoHo markets.

Based on Matrox's MGA-2064W controller, the PowerDoc Edition reviewed here is actually an MGA Millennium with a faster 250MHz DAC and sophisticated Document Image Processing (DIP) software attached to it. Our review model came with 2Mb of Windows RAM (WRAM) upgradable to 8Mb; the only card in the group test to do so. The 2Mb PowerDoc Edition offers resolutions of 800 x 600 at 32 bits and 1152 x 882 at 65, 536 colours, with the remaining colour depths of 1280 x1024 to 1600 x 1280 holding at 256 colours.

If you've loads of cash you can upgrade to 8Mb of WRAM, purchase an Hitachi CM-2112 monitor and run the monitor at an amazing 1880 x 1440!

Installing and setting up the Matrox came easily. Windows 95 detected the presence of the card upon startup and driver installation flowed from there. Matrox integrates its utilities well with the Display Properties menu and provides zoom, monitor, and refresh rate selection via its Powerdesk and Quick Access add-ons.

We were supplied with Matrox's newest drivers at the time of writing this and found that well-written drivers do indeed make the difference. The PowerDoc Edition ran our video test flawlessly, dropping not one frame in either format. A truly worthy card.

Details

Matrox Millennium PowerDoc
Price £339
Contact Matrox (UK) 01793 441144.
Fax 01793 441199

Good Points Can upgrade memory to 8Mb.
Bad Points None to speak of.
Conclusion Great for big business but not really the home. Stick to its junior, the Matrox Millennium.

Scores					
Usability					5
Documentation					4
Utilities					4
Value					3

152
PERSONAL COMPUTER WORLD
JUNE 1996

153
PERSONAL COMPUTER WORLD
JUNE 1996

miroVideo 20SV

When we looked on the box of the miroVideo 20SV we instantly noticed the words "German Engineering" and felt reassured that this would be a good graphics card. Once we opened the box and began to install it, our faith began to wane.

When we began to install miro's software the first thing that came up was an installation screen in German. For those not familiar with the language or the basic layout of Windows 95 menus, getting to the English screen could prove to be a bit of a trial. The second item that caught our attention was the version and date of the drivers and utilities. We had version 1.0 and the date of the software was 06/09/95, which means that, in computer world terms, these drivers are quite old. miro says new drivers have been issued.

The result of the old drivers shows up in the test results. The miro didn't complete one of the application tests and it trailed many Trio 64V+ based cards on the other tests. It was also the only Trio 64V+ based chip to drop frames on the video playback test at 1024 x 768 in 16-bit colour.

It can manage a maximum resolution and refresh rate of 1024 x 768 at 100Hz. The upper resolution limit of this card is 1280 x 1024 in 256 colours at 75Hz. The miroWintools were a bit cumbersome, forcing the user to use a fruit machine-like interface to choose the resolution, almost pixel by pixel, instead of being able to choose a pre-set resolution.

In all, this is a pricey card for what it offers.

Details

miroVideo 20SV
Price £191 (2Mb) excl. VAT
Contact miro UK 01494 510250.
Fax 01494 510070

Good Points Makes you yearn to learn German.
Bad Points Cumbersome utilities, poor performance, old drivers.
Conclusion Back of the pack and not worth the price.

Scores		
Usability		2
Documentation		2
Utilities		3
Value		2

miroVideo 22SD

This 2Mb EDO RAM based card gave us a pleasant surprise when compared to its more expensive sister card, the miroVideo 20SV. In terms of overall performance it bettered the 20SV in all but the video tests; however, the 22SD still came up short when compared to the rest.

The 22SD uses the S3 Trio64V+ display controller and integrated 135MHz RAMDAC. Unfortunately, when video cards use identical components, such as the S3 chip, it's hard to differentiate their actual capabilities and the same goes for the 22SD. Like most Trio 64V+ based cards it supports resolutions up to 1200 x 1024 at 75Hz running in 256 colours. 16 million colours can be found at 640 x 480 and 800 x 600 while 1024 x 768 will run at a maximum of 65,535 colours. Refresh rates range from 100Hz at 640 x 480 to 75Hz at 1200 x 1024.

Installing the utilities and drivers was reasonably easy, but you'll find that Windows 95 will identify the S3 chip and not the miro card as a new component. You'll have to use the install New Hardware feature of Windows 95 to install the correct drivers. Once this is done, you'll find the same situation as the 20SV regarding the initial German interface as well as the same set of miroWintools utilities. The 22SD comes with drivers for the main PC operating systems, such as NT and OS/2. miro included old drivers dating from November 1995, but has recently posted updates on its BBS and web site.

Details

miroVideo 22SD
Price £123 (2Mb) excl. VAT
Contact miro UK 01494 510250.
Fax 01494 510070

Good Points Better than the miro 20SV and more reasonably priced.
Bad Points Still not great.
Conclusion Does the job but trails the pack.

Scores		
Usability		3
Documentation		2.5
Utilities		2.5
Value		3.5

Number Nine 9FX

The 9FX Motion 331 was one of the most trouble-free cards in the group. It came with comprehensive documentation, was easy to install, and has a five-year warranty; something you'd expect from such a well-known company.

The 9FX is a half-length card with a VESA VGA loop-through connector as well as a LPB connector for a MPEG add-on. Our card came with 2Mb of EDO DRAM but a 1Mb version (upgradable to 2Mb) is available.

Like five of the other cards it, too, uses a S3 Trio 64V+ chip with integrated RAMDAC. It will support 16 million colours to 800 x 600 resolution, dropping to 65,535 at 1024 x 768 and 256 colours at its maximum resolution of 1280 x 1024. Interestingly, its maximum resolution at maximum vertical refresh rate is 74Hz at 1152 x 864, which is ideal for 17in monitors. Otherwise, its choice of non-interlaced refresh rate ranges from 150Hz at 640 x 480 to 72Hz at 1280 x 1024, providing the user with screen images free from eye-strain.

The 9FX Motion 331 also comes with a full range of drivers for all the major operating systems.

In terms of performance the 9FX tended to trail that of its major rivals which also use the same S3 chip. It did, however, do very well in both video tests as well as its handling of our labs test of primitive graphics applications.

On the whole, this card comes with a good set of utilities and won't disappoint if you're looking for bog-standard reliability.

Details

Number Nine 9FX Motion 331
Price £139 (2Mb) excl. VAT
Contact Number Nine Visual Technology 01256 381594. Fax: 01256 381194

Good Points Good documentation and reliable performance.
Bad Points None to complain about.
Conclusion A bog-standard card at a reasonable price that shouldn't let you down.

Scores		
Usability		5
Documentation		5
Utilities		4.5
Value		4

Orchid Kelvin Video 64

This card was one of the two beta preview cards sent to participate in the test so we didn't expect much. When our test results came back, however, we were completely surprised. The Kelvin Video 64 consistently placed in the top five results, and that was with a beta set of drivers that still had some bugs.

Bugs aside, this card looks like a contender. It's built around the Alliance 6410 controller chip with 135MHz internal RAMDAC. Resolution and colour depth support is similar to many of the S3-based cards with it able to accomplish a maximum of 1600 x 1200 in 8-bit colour. It's the same for maximum vertical refresh rates beginning with 150Hz at 640 x 480 to 75Hz at 1280 x 1024.

The set of utilities that comes with it looks to be very strong. There's on-the-fly bit depth and resolution switching, virtual desktop support, and a good click-and-point refresh rate selection menu. As well, you can abandon your monitor adjustment dials for the utility controls if you so choose. It includes a standard VESA feature connector as well as 1Mb or 2Mb of DRAM, depending on what you choose.

For a preview card, the Orchid's debut was impressive. The drivers appear to be highly optimised across all levels.

The black mark due Orchid in this group test is its two-year warranty. Surely, such a company with such a card can do better than that?

Details

Orchid Kelvin Video 64
Price £99 (1Mb), £147 (2Mb) excl. VAT
Contact Orchid (Europe) 01256 479898.
Fax: 01256 64222

Good Points Fast, fast, fast.
Bad Points Only has a two-year warranty.
Conclusion So long as the drivers stay optimised, the Kelvin Video 64 could be a real contender.

Scores		
Usability *Beta*		1
Documentation		4
Utilities		3
Value		3.5

Phillips Paradise Pipeline 64

When we asked Phillips Electronics for its newest graphics card, we were sent the Paradise Pipeline 64. What we didn't know was that it was going to be the very first card to be seen or tested in the UK. As a result, it didn't come with a complete set of drivers and utilities.

But that didn't stop the card from performing well in our tests. Using a Western Digital WD9710 controller chip with integrated 135MHz RAMDAC, it stood out from most of the pack. The Pipeline 64 is similar to the ATI in its resolution and refresh rates. It's capable of colour depths of 16 million colours up to 800 x 600, 65,535 colours up to 1280 x 1024, and 256 colours at 1600 x 1200.

It does, however, let one down on its refresh rate capability. The maximum refresh rate available is 75Hz up to a resolution of 1024 x 768. This will of course allow for a flicker-free screen image, but its choice is less than that of the others in the group. At 1280 x 1024 the refresh drops to 60Hz and at 1600 x 1280 it bottoms out to a paltry 43Hz interlaced. If you chose to operate at these resolutions, you could be in for serious eye-strain.

Not much can really be said of the Oasis 95 utilities included with the Pipeline 64 as they weren't completed when we examined them. But our first impressions show they'll have the functions you'd expect.

Details

Phillips Paradise Pipeline 64
Price Expected £129 (2Mb) excl. VAT
Contact Phillips UK 0181 689 4444.
Fax 0181 781 8979

Good Points Better performance at 800 x 600 in 32-bit colour.
Bad Points Refresh rate at higher resolutions is below standard.
Conclusion It's still in the beta stage but early indications are good.

Scores		
Usability		4
Documentation		3
Utilities		1
Value		3.5

STB Powergraph 64 Video

Once known as Simply The Best, STB has lessened its bravado and it's a good thing, too. The Powergraph 64 Video wouldn't quite live up to its name, but for £95 maybe you can't complain.

As the second cheapest card in the group, the STB Powergraph tended to come in second to last in our tests so it's fair to say that this isn't the fastest card of the lot. It does provide, however, a good screen image with rich colours and no fuzziness. The STB Vision 95 Control Panel utility provides an easy-to-use, well-designed interface. You can change refresh rates, zoom in, switch resolution and run multiple desktops all by clicking on the appropriate button.

The S3 Trio64V+ chip supports resolutions up to 1280 x 1024 at 256 colours. For deeper colour depths you'll have to use either 640 x 480 or 800 x 600 for 16 million colours, or 1024 x 768 for 65,535 colours. According to STB the Powergraph 64 has refresh rates ranging from 160Hz for 640 x 480 to 75Hz for 1280 x 1024. This is excellent for flicker-free screens, assuming your monitor is capable of handling the high frequencies.

STB has set itself apart from the rest of the group-test members by including a game CD-ROM, Comanche Maximum Overkill, with the card. It also includes the Xing MPEG software player plus drivers for OS/2, NT, Windows 3.1, AutoCAD and Windows 95. STB has also topped the competition by offering a ten-year warranty, at least twice as long as anyone else.

Details

STB Powergraph 64 Video
Price £69 (1Mb), £95 (2Mb) est.street price excl. VAT
Contact STB Systems 0181 897 1003.
Fax 0181 897 1006

Good Points Good screen image, excellent warranty.
Bad Points Not the best, especially in performance.
Conclusion A low-priced card that has lots of software extras.

Scores		
Usability		4
Documentation		5
Utilities		4.5
Value		5

STB Velocity 64 Video

The Velocity 64 Video was the only 4Mb EDO VRAM card that entered the group test, allowing it to sustain a much greater colour depth at a higher resolution. The Velocity 64 is able to comfortably go to 1600 x 1200 at 16-bit high colour and sustain a refresh rate of 80Hz on top of that. Not too shabby if you're looking to operate at high resolutions and have a flicker-free screen.

But what you get in capability, you lose in speed. The STB, like its cousin the Powergraph 64, didn't top the charts in our tests. It tended to fall into the lower third of the group test overall and it was one of the four cards that dropped frames in both our video tests — a bad indication for a video card. It also scored low on our Doom2 test in DOS.

That aside, the card still does the job. It manages resolutions of 640 x 480, 800 x 600, 1024 x 768, and 1280 x 1024 in 32-bit colour at refresh rates of 160Hz, 160Hz, 120Hz, and 85Hz respectively. This is due to STB's use of the S3 Vision 968 chip in conjunction with an IBM 220MHz RAMDAC.

Oddly, one would expect that with the S3 chip, IBM RAMDAC and fast EDO VRAM the STB should be a speed demon, but this isn't the case, which was a bit disappointing.

The Velocity 64 also comes with the Comanche Maximum Overkill game and all relevant PC drivers.

Details

STB Velocity 64 Video
Price £219 (2Mb), £319 (4Mb) excl. VAT
Contact STB Systems 0181 897 1003.
Fax 0181 897 1006

Good Points Can sustain high refresh rates at high resolutions.
Bad Points Showed weakness in video tests.
Conclusion Not our first choice for a 4Mb card.

Scores		
Usability		3.5
Documentation		5.5
Utilities		4.5
Value		2.5

VideoLogic GrafixStar 400

HIGHLY COMMENDED

The GrafixStar 400 is a budget graphics card aimed more at the home market, but its performance and capabilities were excellent. With an RRP of £165 (£130 street) VideoLogic is going head to head with the Diamond Stealth 64 Video 2201. In terms of performance, the GrafixStar 400 either matched or slightly bettered the 2201, especially on the application side of the tests. It also held up well in the video test, dropping no frames at 1024 x 768 in 16-bit colour.

The GrafixStar's capabilities are almost identical to Diamond's and most of the other S3 Trio 64V+ based cards. It manages 32-bit colour in resolutions of 640 x 480 and 800 x 600, 16-bit colour at 1024 x 768 and 8-bit up to 1600 x 1200. The integrated on-chip RAMDAC runs at a frequency of 135Hz, allowing for refresh rates above 72Hz until you reach 1600 x 1200 where it drops to 60Hz, but that's not a disadvantage if you're using anything less than a 21in monitor. In terms of the video output the colour was a little less rich than some of the other cards, but images were crisp and clear with no sign of glitches.

The card comes with either 1Mb or 2Mb of EDO RAM and a local peripheral bus feature connector to accommodate its "Scenic Highway" MPEG daughterboard. The whole gamut of drivers are provided ranging from Windows 3.1 to NT and OS/2. The Smart Tools utilities, which are extensive, include zoom, on-the-fly resolution changing and refresh rate adjustment.

Details

VideoLogic GrafixStar 400
Price RRP £115 (1Mb), £80 street;
RRP £165 (2Mb), £130 street, excl. VAT
Contact 01923 260511. Fax: 01923 270188

Good Points Affordable and provides good performance.
Bad Points None to speak of.
Conclusion An excellent choice in price/performance ratio.

Scores		
Usability		4
Documentation		5
Utilities		5.5
Value		5.5

Graphics cards: a glossary

DRAM
Dynamic Random Access Memory. Standard memory chip, mostly used in older PCs that are considered less efficient than VRAM or EDO RAM.

EDO DRAM
Extended Data Out DRAM. A more efficient memory with faster access time primarily used in newer PCs.

VRAM
Video RAM. Fast memory optimised for graphics cards. Considered faster than EDO RAM and DRAM.

WRAM
Windows RAM. Fast video memory optimised for a Windows GUI environment used by Matrox.

RAMDAC or DAC
Random Access Memory Digital to Analogue Convertor. It converts the digital data from the PC to the analogue data required by the monitor for display.

VGA feature connector
A standard 26-pin plug for passing the VGA signal on to some other device, often a video overlay board. The feature connector cannot pass the high-resolution signal from the card and is limited to VGA.

LPB
Local Peripheral Bus. A specific feature connector used to connect MPEG or other related components (such as TV tuners) to the graphics card.

VM Channel
Vesa Media Channel. VESA's video bus which aviods the main system bus.

Refresh Rate (or vertical scan rate)
The frequency with which the whole screen is refreshed. At 60Hz (60 times a second) flicker is quite apparent. Above 72Hz the flicker appears to go away. Increasing the refresh rate above 72Hz makes the image increasingly solid.

Interlacing
Where only every other line on the screen is refreshed with each pass. It is a way of increasing the colour depth or resolution if the card hasn't the muscle to do the job properly. The result is very flickery and certainly not recommended for long periods.

Virtual desktop
When the card is capable of holding in its memory a resolution greater than that being displayed on screen, the monitor can act a a "window" onto a larger viewing area. Using this system you can pan across your "desktop".

On-the-fly switching
A term used regarding the changing of resolution or refresh rates without needing to restart your PC.

Mac cards

Now that Apple has integrated PCI bus technology into its PowerMacs, PC hardware specialists are moving their products to this platform. Among the first to deliver video cards are Diamond, Matrox and Number Nine, each with a proven track record and unique hardware solution.

Diamond's Javelin Video series is based on the S3 968 processor, as used in the company's popular Stealth range of products. It comes in two versions, 3240XL and 3400XI, with 2Mb and 4Mb of VRAM respectively. In standard configurations the 3240 can handle 24-bit colour at 800x600 pixels, the 3400 at 1024x768. Higher resolutions up to 1600 x 1200 are supported and a stable 75Hz refresh is available for all modes.

The Javelin is interesting in that it claims to accelerate QuickTime video functions as well as traditional graphic areas such as scrolling and bit blitting. The S3 chip has built-in support for this but the current version of QuickTime allows only limited acceleration. The first version to make full use of hardware accelerators will be QuickTime 2.2, due at some point this summer.

Along with a driver extension Diamond provides a copy of KPT Convolver SE, Color It LE 3.0 and 200Mb of images for you to play with.

In tests with a PowerMac 9500 the Javelin proved faster than Apple's own video card, a 2Mb model manufactured by ATI. Screen-to-screen bit blits were noticeably fast but, as expected, QuickTime acceleration was nowhere to be seen.

The Matrox solution is a version of the Millennium, which works in exactly the same way as its PC counterpart. The card uses the company's own custom MGA chipset, offering 3D acceleration as well as fast 2D functions. This is coupled with new Windows RAM (WRAM) for top performance, and *PCW* was supplied with a 4Mb version for testing.

The Millennium's 3D functions are aimed squarely at such areas as CAD, with hardware gourad shading but no texture mapping facilities. This more or less rules it out of the upcoming 3D games area although Matrox has plans for this market. The only software supplied by Matrox is an easily installable Control Panel for setting resolution, bit depths and so on.

The Millennium came top in our Mac speed tests but performance was ever so slightly flawed by a small problem. In tests, the zooming that appears when you open a folder seemed to stick from time to time.

Number Nine's Imagine 128 is again the same as the PC version, and uses a large 128-bit custom processor together with either 4Mb or 8Mb of VRAM. A Mac version of the company's HawkEye Control Panel offers functions such as Pan and Zoom, and options for a screen saver and realtime window dragging.

The Imagine proved to be the slowest of all three cards, although it was still faster than standard ATI video. It's doubtful that this is a reflection on the hardware itself, though: the drivers are far more likely to be the culprit. And this is possibly the most important issue surrounding Mac PCI cards at the moment. If there has to be a winner then the award goes to Matrox, but all the products would benefit from further driver development.
Chris Cain

• *The Diamond Javelin Video costs £249 (2Mb), £369 (4Mb)*
• *The Number Nine Imagine 128 costs £475 (4Mb), £1039 (8Mb)*
• *The Matrox Millennium PowerMac costs RRP £369 (4Mb), £599 (8Mb)*

Mac benchmarks

All tests performed on a 9500/132

8-bit colour @ 1024 x 768 pixels	Norton Index
Matrox Millennium	413
Diamond Javelin Video	402
Number Nine Imagine 128	399
Standard ATI	361

16-bit colour @ 1024x768	
Matrox Millennium	332
Diamond Javelin Video	313
Number Nine Imagine 128	304
Standard ATI	280

Resolution and colour

Windows objects, icons, spreadsheet cells, title bars will always be the same number of pixels in size whatever the resolution. Consequently, at higher resolutions they will appear smaller and you'll be able to fit more on the desktop. Of course, make them *too* small and you won't be able to see them at all, which is why higher resolutions work better on physically larger monitors where the pixels are correspondingly larger.

Typical ideal resolutions on certain-sized monitors are 640 x 480 on a 14in, 800 x 600 or 1024 x 768 on a 15in, 1024 x 768 or 1152 x 882 on a 17in and 1280 x 1024 or even 1600 x 1200 on a 20/21in display, but be sure your display will be able to cope with any modes you have in mind.

VGA mode works at a resolution of 640 by 480 pixels in 16 colours or sometimes 256, requiring around 256Kb of video memory. A resolution of 1024 by 768 pixels in 256 colours requires 1Mb of video memory. Numbers of colours, or pixel depth, is often described as numbers of bits. The total number of colours is 2 to the power of the number of bits; 8 bit offers 256 colours, 16-bit (high colour) supplies 65,536 and 24/32-bit (true colour) reaches that mystical figure of 16,777,216 colours.

If you want a display to fool the eye into seeing full colour, you need 256 shades of red, green and blue; that is 8 bits per three primary colours, hence 24 bits in total. 16-bit colour requires twice the memory of 8-bit, while 24-bit colour requires *three* times the memory than 8-bit at the same resolution. Consequently, 16-bit colour at 1024 by 768 pixels would require 2Mb of video memory, and 24-bit would need 3Mb. If you have the appropriate drivers, 1Mb of video memory can do 1024 by 768 pixels in 8-bit, 16-bit at 800 by 600 pixels or 24-bit at 640 by 480 pixels.

Interlacing is the process of drawing every other line until the entire screen is full, then going back to the top and drawing the others again until the bottom is reached. Since an entire frame is drawn in two goes, the resulting effect is a highly undesirable flickering display. Non-interlaced (NI) is where every line is drawn before returning to the top for the next frame, resulting in a far steadier display.

The last point to note is refresh rate, measured in Hertz (Hz) and representing the number of frames displayed on screen per second. Too few, and the eye will notice the intervals in between and perceive a flickering display. The worldwide accepted refresh rate for a flicker-free display is 70Hz and above, although many can see improvements from 72 to 75Hz. Below 70Hz is unacceptable to most eyes, as are any interlaced modes. Ensure your monitor is capable of displaying the resolution at the refresh rate you desire. If you push your monitor too hard, it won't display anything at all.
Gordon Laing

RAMDAC:
Controls the digital image coming from the PC and converts it to an analogue signal for the monitor. It's very imortant for refresh rate and colour palette. Some RAMDACs are integrated into the graphics controller chip

VGA Feature Connector:
Used to connect other expansion cards to transfer data to and from each other

Local Peripheral Bus (LPB):
Used for add-ons such as MPEG daughterboards

On-board Video Memory:
Commonly consists of 2Mb of memory, but some boards can come with up to 8Mb

Video-in Socket:
Not common to many cards at the moment. Used for input of video images from VCRs and so on

SVGA Monitor Connector (HD-15):
15-pin plug connecting the graphics card to the monitor

Graphics Processor Chip:
The heart of the graphics card. Controls resolution, colour depth (with RAMDAC) and all elements associated with rendering images on screen

Video Memory upgrade board:
Daughterboard used to upgrade video memory that plugs into the video memory feature connectors
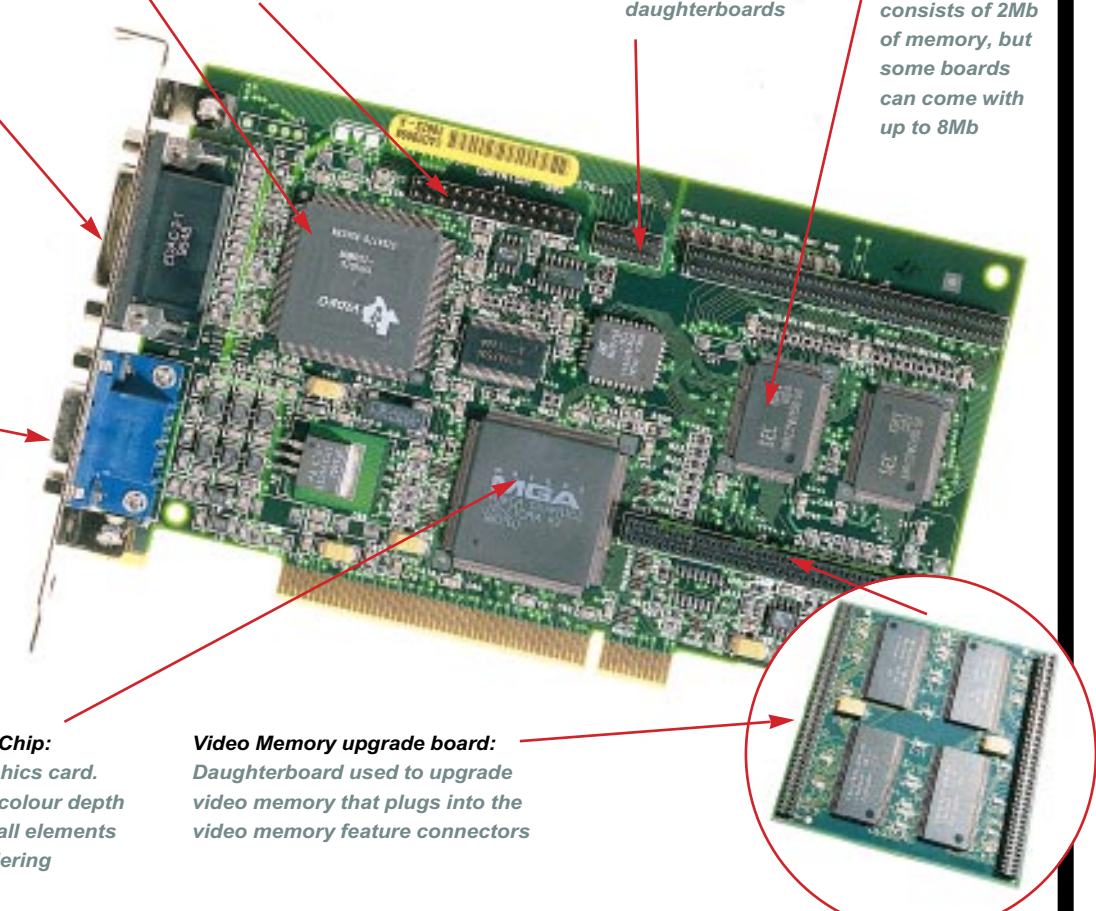
Editor's Choice

This year's group test proved to be a tough one when it came to selecting the Editor's Choice. With the advent of Windows 95, more video capability and the presence of so many S3 chip-based cards, choosing the "fittest" of the lot proved a trial.

We could have selected a card based on overall speed but by doing so we would have had to ignore cost, and that's too important to forget. So factors such as utilities, ease of installation (or usability), documentation and value were combined with performance when considering our choice.

With this said and done we found one card that impressed us the most and, thus, was awarded Editor's Choice — the ATI Video Xpression. It performed very well in all of our application and graphics primitive tests, with it being specially optimised for 800 x 600 resolution in true colour. This is ideal for the multitude of users out there with 14in and 15 in monitors. It has a powerful graphics engine in the form of the ATI Mach 65 264VT chip and it comes with only 2Mb of standard DRAM for its video memory. It also provides a good range of resolution and colour depth while maintaining a minimum vertical refresh rate above 75Hz. The RRP of the Video Xpression is listed at £175 but street prices tend to hover at £129, which is a good buy if you want speed at an affordable price.

Our runners-up and recipients of a Highly Commended award are the VideoLogic GrafixStar 400 and the Diamond Stealth Video VRAM. The GrafixStar 400 is one of those truly affordable cards that delivers respectable capability and performance. It's not able to leap tall buildings in a single bound but it does provide a colour depth of 65, 535 colours at 1024 x 768. Its speed can be attributed to its use of EDO RAM and S3 Trio 64V+ optimised drivers.

The Diamond Stealth Video 3400XL was chosen for one main reason: speed. Looking at the results, it performed particularly well on the applications test at 1024 x 768 in 16-bit colour. Most cards are now optimised for this resolution but it's apparent the Diamond Stealth Video 3400XL GT drivers are the best for this, which means that Windows users should benefit well.

Outstanding omissions include the Orchid and Paradise cards. They did great but they're still in development, so we decided to wait and see how the final versions come out. They should be in the shops by the end of May or early June.

GRAPHICS CARDS TABLE OF FEATURES

Manufacturer Model	ATI Video Xpression	Cirrus Logic CLGD-5446 Chip	Diamond Diamond Stealth 64 Video 2201XL	Diamond Diamond Stealth 64 Video 3400XL	Hercules Graphics Terminator 64 Video	Matrox MGA Millennium PowerDoc Edition	miro miro Video 20SV
Supplier/contact	ATI Technologies	N/A	Evesham Micros	Evesham Micros	Imago Micro	Matrox UK	miro UK
Telephone	01235 833666	N/A	01386 765500	01386 765500	01635 861122	01793 441100	01494 510250
Fax	01235 833668	N/A	01386 765354	01386 765354	01635 868188	01793 441199	01494 510070
Price (with 2Mb or 4Mb) excl.VAT	£175 (2Mb, £130 street)	N/A	£115 (2Mb)	£189 (2Mb) £289 (4Mb)	£215 (2Mb)	£339 (2Mb)	£191 (2Mb)
RAM Type	DRAM	EDO DRAM	EDO DRAM	VRAM	EDO DRAM	WRAM	VRAM
Max RAM (Mb)	2	4	2	4	2	8	2
Price of MPEG module (excl.VAT)	N/A	N/A	£88	£179	N/A	£235	N/A
Processor	Mach 64 264VT	CLGD-5446	S3 Trio 64V+	S3 Vision 968	S3 Trio 64V+	MGA 2064W	S3 Vision 968
Processor type	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit
RAMDAC (MHz)	135	135	135	220	135	250	135
Video Bus Standard							
VESA Media Channel (VMC)	○	○	○	○	○	○	○
VAFC**	○	●	○	○	●	○	○
PCI*	●	●	●	●	●	●	●
3D Support							
3D Acceleration	○	○	○	○	○	○	○
3D Libraries supported							
Direct 3D	○	○	○	○	○	●	○
Quickdraw 3D	○	○	○	○	○	○	○
Feature connector							
VESA	●	●	●	●	●	○	●
MCA	○	○	○	○	○	○	●
Local Peripheral Bus (LPB)	●	●	●	○	○	○	○
Video acceleration	●	●	●	●	●	●	●
Resolution and Refresh							
Max bit depth 640 x 480	32	24	32	32	24	32	32
Max bit depth 800 x 600	24	24	32	32	24	32	32
Max bit depth 1024 x 768	16	16	16	32	16	32	16
Max bit depth 1280 x 1024	8	8	8	32	8	24	8
Max bit depth 1600 x 1200	N/A	N/A	N/A	16	8	24	N/A
Max refresh 640 x 480 (Hz)	120	85	120	120	120	200	100
Max refresh 800 x 600 (Hz)	120	85	120	120	120	200	100
Max refresh 1024 x 768 (Hz)	120	85	100	120	90	120	100
Max refresh 1280 x 1024 (Hz)	75	75	75	90	75	110	75
Max refresh 1600 x 1200 (Hz)	N/A	N/A	N/A	76	86 (int.)	85	N/A
Max res. at max. refresh	1024 x 768 @ 120Hz	1024 x 768 @ 85Hz	800 x 600 @ 120Hz	1024 x 768 @ 120Hz	800 x 600 @ 120Hz	800 x 600 @ 200Hz	1024 x 768 @ 100Hz
Refresh-rate selection utility	●	●	●	●	●	●	●
On-the-fly resolution switching	●	●	●	●	●	●	●
On-the-fly bit depth switching	●(Win 3.1)	○	●	●	○	●(Win 3.1)	○
Extras/Drivers							
Virtual desktop	●	○	●	●	●	●	●
Zoom	●	●	●	●	●	●	●
Windows 95 drivers	●	●	●	●	●	●	●
Windows 3.1x drivers	●	●	●	●	●	●	●
Microsoft NT drivers	●	●	●	●	●	●	○
OS/2 drivers	●	●	●	●	●	●	●
AutoCAD drivers	●	●	●	●	○	●	●
Warranty (years)	5	N/A	5	5	5	5	2
Free Tech Support	●	N/A	●	●	●	●	●
Additional software	MPEG Player		MPEG Arcade, Runtime for Windows	3DFX, Corel Draw 4, MPEG Arcade, Runtime for Windows		Compcore Software MPEG, Document Viewer	

KEY ● Yes ○ No
***PCI** Peripheral Component Interconect   ****VAFC** VESA Advanced Feature Connector

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GRAPHICS CARDS TABLE OF FEATURES

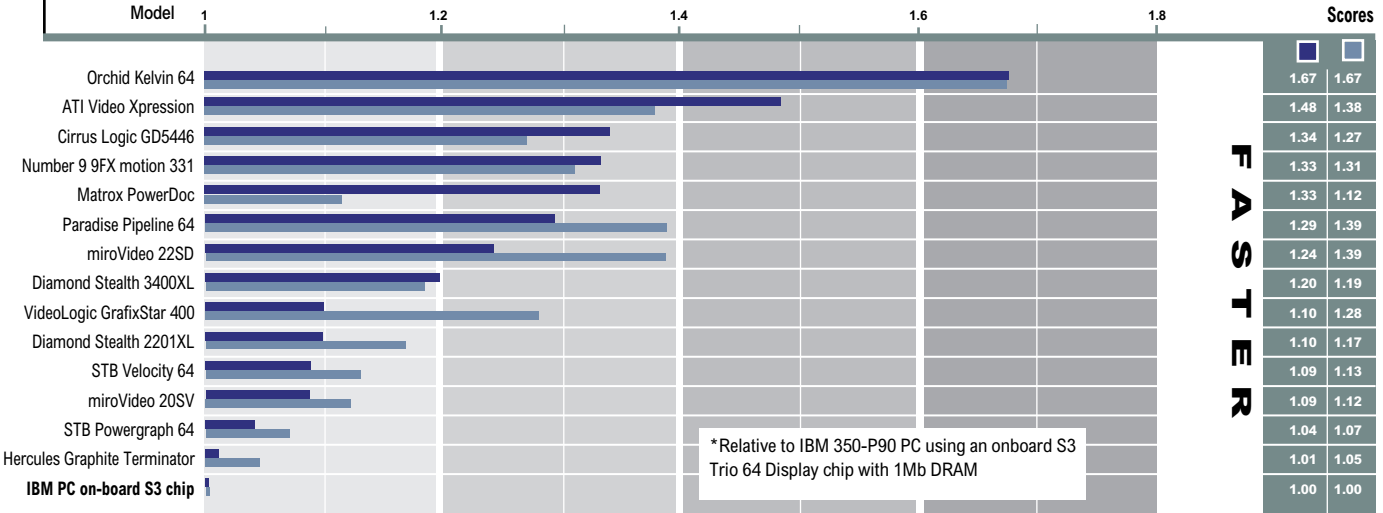| Manufacturer Model	miro miro Video 22SD	Number Nine 9FX Motion 331	Orchid Kelvin Video 64	Paradise Pipeline 64	STB Powergraph 64 Video	STB Velocity 64 Video	VideoLogic GrafixStar 400
Supplier/contact	miro UK	Number Nine Visual Technology	Orchid (Europe)	Philips Electronics (UK)	STB Systems	STB Systems	VideoLogic
Telephone	01494 510250	01256 381594	01256 479898	0181 689 4444	0181 897 1003	0181 897 1003	01923 260511
Fax	01494 510070	01256 381194	01256 64222	0181 781 8979	0181 897 1006	0181 897 1006	01923 270188
Price (with 2Mb or 4Mb) excl.VAT	£123 (2Mb)	£139 (2Mb)	£147 (2Mb)	expected £129	£95 (2Mb)	£219 (2Mb) £319 (4Mb)	" £165 (2Mb, " £130 street)
RAM Type	EDO DRAM	EDO DRAM	DRAM	EDO DRAM	EDO DRAM	EDO DRAM	EDO DRAM
Max RAM (Mb)	2	2	2	2	2	4	2
Price of MPEG module***	N/A	N/A	N/A	N/A	N/A	N/A	£89 (£75 street)
Processor	S3 Trio 64V+	S3 Trio 64V+	Alliance 6410	WD9710-MZ	S3 Trio 64V+	S3 Vision 968	S3 Trio 64V+
Processor type	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit	64-bit
RAMDAC (MHz)	135	135	135	135	135	220	135
Video Bus Standard							
VESA Media Channel (VMC)	○	○	○	○	○	○	○
VAFC**	○	○	○	○	○	○	○
PCI*	●	●	●	●	●	●	●
3D Support							
3D Acceleration	○	○	○	○	○	○	○
3D Libraries supported							
Direct 3D	○	○	○	○	○	○	○
Quickdraw 3D	○	○	○	○	○	○	○
Feature connector							
VESA	●	●	●	●	●	○	●
MCA	●	○	○	○	○	○	○
Local Peripheral Bus (LPB)	○	●	○	○	○	○	●
Video acceleration	●	●	●	●	●	○	●
Resolution and Refresh							
Max bit depth 640 x 480	32	32	32	32	32	32	32
Max bit depth 800 x 600	32	32	32	32	32	32	32
Max bit depth 1024 x 768	16	16	16	16	16	32	16
Max bit depth 1280 x 1024	8	8	8	16	8	32	8
Max bit depth 1600 x 1200	N/A	N/A	8	8	N/A	16	8
Max refresh 640 x 480 (Hz)	100	150	150	75	160	160	120
Max refresh 800 x 600 (Hz)	100	130	120	75	140	160	120
Max refresh 1024 x 768 (Hz)	100	78	120	75	120	120	100
Max refresh 1280 x 1024 (Hz)	75	72	75	60	75	85	75
Max refresh 1600 x 1200 (Hz)	N/A	N/A	60	43 (interlaced)	N/A	80	60
Max res. at max. refresh	1024 x 768 @ 100Hz	800 x 600 @ 130Hz	1024 x 768 @ 120Hz	1024 x 768 @ 75Hz	1280 x 1024 @ 75Hz	1600 x 1200 @ 80Hz	800 x 600 ¹
Refresh-rate selection utility	●	●	●	●	●	●	●
On-the-fly resolution switching	●	●	●	●	●	●	●
On-the-fly bit depth switching	○	○	●	●	●	●	○
Extras/Drivers							
Virtual desktop	●	●	●	●	●	●	●
Zoom	●	●	●	●	●	●	●
Windows 95 drivers	●	●	●	●	●	●	●
Windows 3.1x drivers	●	●	●	●	●	●	●
Microsoft NT drivers	○	●	●	●	●	●	●
OS/2 drivers	●	●	●	●	●	●	●
AutoCAD drivers	●	●	●	●	●	●	●
Warranty (years)	2	5	1	5	10	10	5
Free Tech Support	●	●	●	●	●	●	●
Additional software		Runtime for Windows	Xing MPEG	Paradise Video Player	Comanche Maximum Overkill, Xing MPEG	Comanche Maximum Overkill, Xing MPEG	Xing MPEG

KEY ● Yes ○ No
***PCI** Peripheral Component Interconect   ****VAFC** VESA Advanced Feature Connector   *** (excl.VAT)   ¹ @ 120Hz

166
PERSONAL COMPUTER WORLD
JUNE 1996

167
PERSONAL COMPUTER WORLD
JUNE 1996

Performance Results

Graphics Primitive Tests

■ 1024 x 768 in 65,535 colours ■ 800 x 600 in 16 million colours

Model		Scores ■	Scores □
Orchid Kelvin 64		1.67	1.67
ATI Video Xpression		1.48	1.38
Cirrus Logic GD5446		1.34	1.27
Number 9 9FX motion 331		1.33	1.31
Matrox PowerDoc		1.33	1.12
Paradise Pipeline 64		1.29	1.39
miroVideo 22SD		1.24	1.39
Diamond Stealth 3400XL		1.20	1.19
VideoLogic GrafixStar 400		1.10	1.28
Diamond Stealth 2201XL		1.10	1.17
STB Velocity 64		1.09	1.13
miroVideo 20SV		1.09	1.12
STB Powergraph 64		1.04	1.07
Hercules Graphite Terminator		1.01	1.05
IBM PC on-board S3 chip		1.00	1.00

FASTER

*Relative to IBM 350-P90 PC using an onboard S3 Trio 64 Display chip with 1Mb DRAM

Graphics Application Tests

■ 1024 x 768 in 65,535 colours ■ 800 x 600 in 16 million colours

Model		Scores ■	Scores □
Diamond Stealth 3400XL		1.24	1.02
Hercules Graphite Terminator		1.17	0.92
Orchid Kelvin 64		1.14	1.06
VideoLogic GrafixStar 400		1.02	0.98
Diamond Stealth 2201XL		1.01	0.90
Number 9 9FX motion 331		1.00	0.95
STB Powergraph Video		0.99	0.91
STB Velocity 64		0.98	0.92
Matrox PowerDoc		0.95	0.98
Paradise Pipeline 64		0.95	1.06
ATI Video Xpression		0.86	1.23
miroVideo 22SD		0.79	0.96
Cirrus Logic GD5446		0.76	1.18
miroVideo 20SV	DID NOT COMPLETE TEST	0.00	0.84
IBM PC on-board S3 chip		1.00	1.00

FASTER

*Relative to IBM 350-P90 PC using an on-board S3 Trio 64 display chip with 1Mb DRAM

Video for Windows Frame Drops

■ 1024 x 768 in 65,535 colours ■ 800 x 600 in 16 million colours

| Model	Frame Drop Rate ■	Frame Drop Rate □
ATI Video Xpression	63	389
Orchid Kelvin 64	0	382
miroVideo 22SD	134	330
VideoLogic GrafixStar 400	0	312
Cirrus Logic GD5446	6	310
Paradise Pipeline 64	0	276
STB Velocity 64	24	246
Diamond Stealth 3400XL	0	218
miroVideo 20SV	18	216
Hercules Graphite Terminator	0	215
Number 9 9FX Motion 331	0	180
Diamond Stealth 2201XL	0	172
STB Powergraph 64	0	170
Matrox PowerDoc	0	42

SLOWER

Inside Excel 7

Stephen Wells shows you how to get the best from Excel. This month he describes the most significant surface changes between versions 5 and 7.

EXCEL HAS HELD THE inside edge in the spreadsheet market for a number of years. It was the first Windows spreadsheet and inevitably Version 7 is the first Windows 95 spreadsheet.

As there is a lot to cover, I've divided this tutorial into three separate parts. This month I'll show you how to use the major advancements since Excel 5. (There was no Excel 6.) In part two, next month, I'll demonstrate how Excel now offers so many built-in features and add-ons that you may well not have to write even one line of Visual Basic code to tailor it to your specific applications. In part three, I'll concentrate on presentation features.
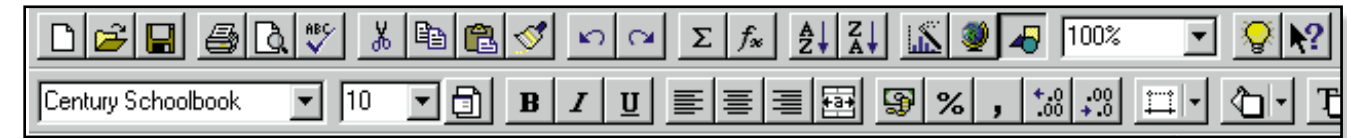
Regrettably, it's a sign of the times that this tutorial is even necessary. Excel 4 came with a massive manual in three volumes. Excel 5's documentation was quite skimpy. Those who get their Excel 7 as part of Office 95 — on the hard disk of a new PC — are lucky if they receive a backup CD. There's nothing on paper at all. This is partly because software prices have been driven down in line with the present bargains in hardware, and partly because publishers would rather just manufacture a stack of CDs at £1 each, than a CD with a thick paperback at, perhaps, £10.

But at least it's easier to get upgrades these days; you can just download them from the Microsoft Excel 95 Forum. If you join The Microsoft Network (MSN) you can even go direct to it from the main Help menu. The last time I did this I received a 30-minute credit on my MSN time charges; so the upgrades are not only free, but the cost of the download can be no more than the price of the phone call.

Excel 7 is also a much greater leap forward over Version 5 than Version 5 was over Version 4. That was really just a catch-up with the competition, mainly adding cosmetic touches like the Tip Wizard and tabs to jump between worksheets and in dialogue boxes.

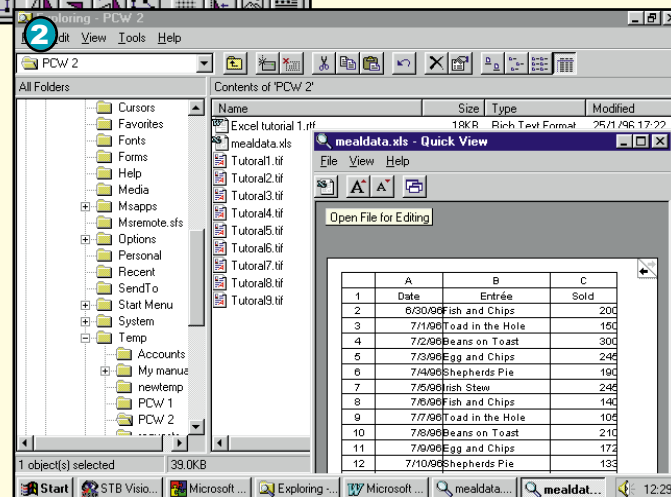You can't run Excel 7 with Windows 3.1, because it has been rewritten in order to take full advantage of the ease of use and power of a 32-bit operating system. According to Microsoft's tests, Excel 7 recalculates, on average, 50 percent faster than Excel 5. It is more efficient with memory, too: a pivot table in Excel 7 needs only 50 percent of the memory of that in Excel 5 running on Windows 3.1.

It has very much the look and feel of Windows 95, with family-style menus, toolbars and dialogue boxes; and more context-sensitive use of the right mouse button. There is a considerable amount of shared code. Many tools and technologies are shared across all Office 95 applications, including Find Fast, Answer Wizard and AutoCorrect. Unfortunately, spellchecking is only common between PowerPoint and Access, so to get the Queen's English

Picture this: What's new in Excel 7
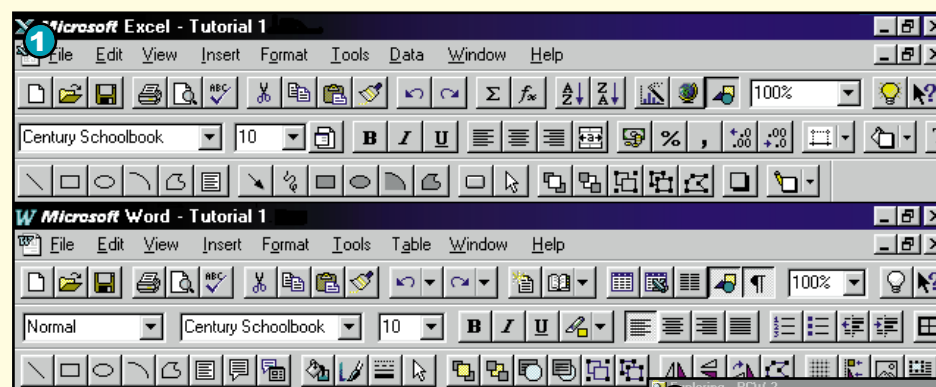
All in the family

Even more lookalike toolbars and dialogue boxes mean once you've learned your way around one Office 95 application, you're half way to navigating them all. Here are the menu bars and default Standard, Formatting and Drawing toolbars in Excel 7 and Word 7 — it's easy to add and delete tools to any of the bars

Taking a peek

Before even opening Excel, you can right-click the mouse and use Quick View in Windows 95 Explorer to preview a corner of the first sheet in any Excel 7 workbook. Alternatively, in the Excel File Open dialogue box you can preview any Excel 7 file, as long as you've checked the SVP box on File, Properties, Summary

Picture this: What's new in Excel 7

Table of Contents

Not only does each sheet in an Excel 7 workbook have a tab, you now have an alternative way to navigate: right-click on the VCR-type controls at the lower left of the screen and a menu of all the tabs is displayed; you can run the cursor up and down this list to choose a worksheet

Easier formatting

The Format dialogue box is less confusing than in earlier versions. You pick from examples which avoid the # signs. The number sample uses the data from the cell where the cursor lies on the worksheet. The other controls change to suit the categories, including phone numbers and postcodes

176
PERSONAL COMPUTER WORLD
JUNE 1996

177
PERSONAL COMPUTER WORLD
JUNE 1996
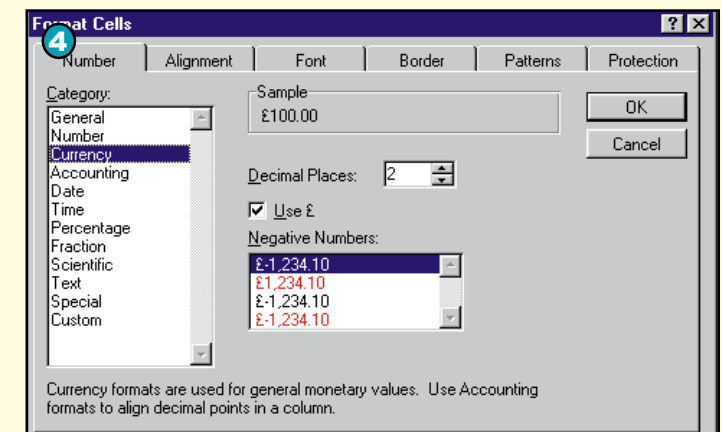
it's necessary to fight different battles with Excel and Word.

Accentuate the positive

But let's eliminate the negatives and accentuate the positives. There is more subtle animated visual feedback for actions such as sliding columns or inserting rows. You can use long filenames and UNC names — the universal naming convention for network servers and shared directories.

DocObjects and the Taskbar

Not only can you drag and drop data between worksheets, workbooks or other Office applications, you can also simply drag and drop onto the desktop. Excel 7 supports OLE automation as a controller and object, so it can drive other applications with its programming language, VBA, and be driven itself. It also supports a new extension to OLE (object linking and embedding) called DocObjects (Document Objects). Small chunks of one application, such as Excel ranges or charts, can be better embedded in another application's document. DocObjects enable an entire document to behave as an object,

complete with styles and print settings.

You can even drag and drop an Excel chunk to another application via the icon in the Windows 95 Taskbar. The Taskbar displays all the open applications and folders at the bottom of the screen.

To copy an Excel chart or block to a Word document, you select the Excel chunk, hold the Ctrl key and, with the mouse, drag your selection down to the Word document icon on the Taskbar. The Word document will automatically maximise and allow you to drop the chunk anywhere. Without the Ctrl key it's a move, not a copy.

There are two provisos: on your Excel sheet make sure the Options, Edit, Allow Cell Drag & Drop box is checked; and keep the mouse and Ctrl key down until the final spot is selected.

Office Binder

Support for DocObjects also lets you place any Excel workbook into an Office Binder along with Word, PowerPoint and Access documents. An Office Binder is similar to an Excel workbook, but it can include files from any Office-compatible application that
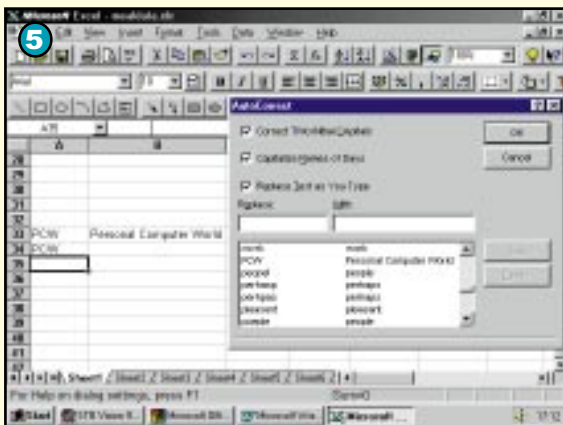
supports DocObject technology.

Since it is a single file, bound documents travel together onto floppy disks, around networks, or via electronic mail. If needed, a Binder can easily be broken apart into separate documents, as is the case with a physical three-ring binder. So you could send a PowerPoint presentation with a packet of Excel charts, a supporting section from an Access database and a Word covering letter, all together.

Excel 7 also has better links with the Windows 95 version of Access, so it can use Access forms in reports in Excel and convert Excel worksheets to Access files.
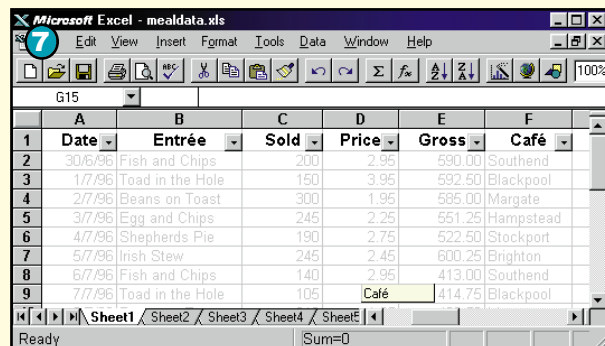
Spreadsheet

With a new version of a spreadsheet which is also part of a suite, the difficulty for the publisher is in deciding whether to provide continuity between the applications in the suite, or between versions. In earlier versions of Excel, for example, if you tried to open a template file, a copy of the template was opened. To edit the original you had to hold down the Shift key while you opened it. In Excel 7 the procedure ➡

Picture this: What's new in Excel 7 (continued)

Instant answers
AutoCalculate lets you find the maximum, minimum, or average of a range, or (Sum) total it. You can count items, or count just the cells containing numbers. Mark the cells, columns, rows, or (using the Ctrl key) non-contiguous ranges to see the result in the Status Bar. Right-click to switch to another function

Automatic typing
AutoCorrect maintains a replacement list shared with Word 7. I told Word to always replace "PCW" with "Personal Computer World" and it worked here, in column B. In cell A34, I only had to enter P and Excel displayed PCW; AutoComplete put in the rest. It works in one column at a time. It's activated under Tools, Options, Edit
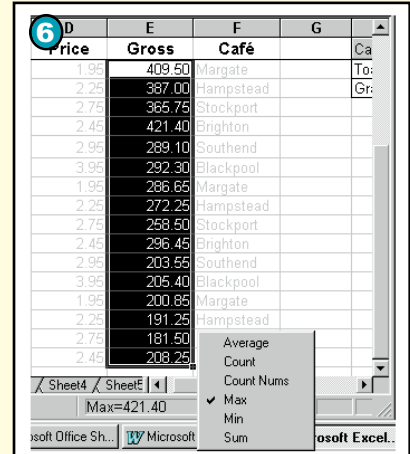
Scrollbar Tips
AutoFilter still turns column labels into drop-down pick lists. Now, when AutoFilter is active, the horizontal scroll bar displays column labels instead of row letters as you slide it. Here, it displays "Café" not "Column F". The vertical scroll bar shows row numbers. Both bars make big leaps if you press Shift while you drag them

X

has been made consistent with Word. But if you become a regular Office 95 application user it soon becomes easier to remember current common procedures than recall earlier ones.

Registry

A significant change concerning Excel power users is that, unlike some other Office 95 applications, Excel 7 never refers to .ini files. It stores all equivalent settings in the much more complicated Windows 95 Registry. Fortunately, Excel 7 offers many more options for changing settings on the Menu Bar.

Networks

Using Excel is now easier on a network. The Shared Lists feature allows more than one user to open and make changes to a workbook at the same time. A Shared List file is posted on to a network server and people use the File, Open command to open it, just as they would for any other file.

Instead of receiving a file-is-in-use warning, users open the file in Shared mode. (The workbook window caption will have "Shared" appended to the filename.) Each user may then enter or

edit the worksheet data and save the file as normal. If two users change the same cell, Excel 7 helps to resolve the conflict.

There is no problem until the users try to save the file. At that point Excel shows smooth diplomacy: the first person to save is not made aware of the problem; the second person to save is shown the details of the conflict and gets to decide which value to keep.

However, all such conflicts are logged into a Conflict History worksheet, automatically created in any shared workbook. For every conflict, the Conflict History sheet contains details such as the Date Deleted and Who Deleted. This allows whoever has "the corner office" to review and reverse earlier decisions made by lesser lights.

Excel 7 uses the same file format as Excel 5.0 for Windows, so upgrading files is automatic. But the file size will increase by 4 to 6K. Ironically, this is because of an optimisation that allows Excel 7 to save files faster.

However, if you create and save a new file in Excel 7, the file is not necessarily larger than an equivalent file created and saved in Excel 5. If you go back to Excel 5 and try to open an Excel

7 workbook, the older version can't update links or find link sources. But return to Excel 7 and open the same file, and the long filename is preserved and links can be updated.

Organisations which use various spreadsheets can rest assured that Excel 7 will read the .WK4 file format used in Lotus 1-2-3 releases 4 and 5, and the .WB1 file format used in Quattro Pro for Windows version 5.0.

Additionally, from Excel 7 you can save in 25 different formats including DIF, SLK, DBF4, Excel V2.1, V3, and V4, as well as the WK4 format.

● *These are all the most significant surface changes between Excel 5 and 7. Next month, we'll get inside and take a test drive; examining the features which can help you to create your own applications.* ◼

PCW Contacts

Stephen Wells welcomes comments on this tutorial and spreadsheets in general, via *PCW* Editorial at the usual address or **Stephen_Wells@msn.com**. Files can be attached if you're on MSN.

Picture this: What's new in Excel 7 (continued)

◀ **Getting sorted**
An improved AutoFilter shows you subsets of your data. Click an arrow for a drop-down selection box offering a custom sort dialogue box, a pick list from the lowest upwards, "All" which gets you back to the full worksheet, or "Top 10" which can also be the Bottom-whatever in numbers or percent

Ask the Wizard ▶
You can ask the Excel Help file questions in your own words: "How do I…?" queries tend to answer with a step-by-step solution, sometimes using macros to open menus and show you the way. "Tell me about…" requests often produce a visual example like this one on chart-making, with clickable Screen Tips
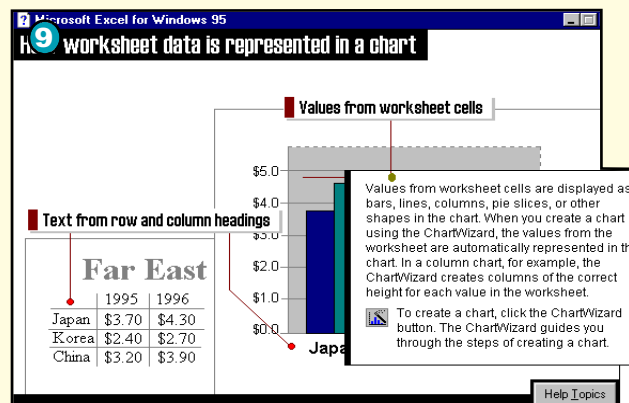
We're getting there...

Bosch's TravelPilot is the James Bond driving gadget of your dreams. *PCW*'s very own boy racer, Simon Rockman, takes it for a spin.

R EMEMBER THE TRACKING device on board the Aston Martin car in the film Goldfinger? Bosch's TravelPilot makes every driver's spy-movie fantasy a reality. It's an in-car computer system which directs you to places. A CD-ROM drive installed in the boot stores a complete road map of London, and the computer uses this information to locate the car. It looks up the destination and plots the route guiding you there.

A firm price has not yet been set, but it's likely to cost around £3,500 when it reaches the UK market in September. By then it will cover the entire M25 area, with the rest of the UK mainland to follow. The version we tested could only cope with London.

TravelPilot uses the top-of-the-range Blaupunkt Berlin RCM 303 as its interface (Blaupunkt is a division of Bosch). The system will play audio compact discs (ten are stored in the autochanger, which is separate from the CD-ROM player) and cassettes, and has a radio with three antennae to give the

best reception possible. There are two circular switches and one rocker switch on the front of the unit. One of the circular switches moves the control between the TravelPilot, radio, cassette and CD. All the features use the 11cm TV screen. The RCM 303 records traffic information, identified by RDS and played over the radio in a separate memory. You can summon up the latest traffic reports by pressing a button in the centre of the circular switch.

The radio and its associated features are wonderful but when the fun stops, the TravelPilot's technology takes over. To use the system, select Set Destination from the first menu, then select an area followed by the street address. This isn't a task you should undertake on the move but a quick stop will pay dividends, and you only need to enter enough of the destination name to be distinctive. There is no information on street numbers so if you are visiting a big road it's best to opt for a small, nearby turning.

When you have entered the details, a large arrow shows the route to your

destination as the crow flies and a soothing female voice tells you, "The route is being calculated." The directions use separate audio circuits to the hi-fi, with the advantage that the music doesn't stop when you are given an instruction. This means that the voice can be drowned out if the hi-fi is too loud and there is no "repeat last instruction" button. After a couple of seconds, the computer says: "The route has been calculated", and gives its first instruction.

There are two views, a simple arrow and a vector map. The yellow arrow shows the direction in which you need to travel: if the computer instructs you to turn right at the second turning, the screen will show a right turn with a faint first turning. A bar graph shows how far away that turning is and the arrow turns red as you approach.

The display shows junctions very simply: it can cope with a wiggly line (bear left or right), left and right turns and roundabouts. Because of the way the computer understands forks in the road, it sometimes gives a strange instruction when travelling against the fork.

The vector map shows you all the roads in the area and the route the system has plotted. The view has a zoom from 0.1 of a mile (not detailed enough) to five miles (too crowded) but gives a good view of other routes. The test disc

even held some roads on Ministry of Defence land which are not shown on normal maps. In addition to the map, the vector display shows panels containing a small version of the direction arrow which points directly towards your destination, a compass pointing to magnetic north and the number of GPS (global positioning system) satellites in view.

You can use the vector map to get a feel for what lies ahead. The view rotates to show the forward direction. Once you have used the system for a little while, you become confident in it and can relax with the simple spoken directions. These say things like: "Prepare to go straight ahead in 300 yards", or "Take the next

Without a keyboard, you have to enter destinations a letter at a time

left followed by a sharp right". All the instructions are precise and clear.

The TravelPilot is inflexible, so if a new road is built or an old one blocked off, you'd need a new disc. The software will always calculate the same route — there are no alternatives. This means you can't rely on local knowledge and there is very little help on which lane to be in at any given time. It would be good to be able to "avoid" places, and for the

road haulage industry it would be particularly useful if the software could be told about busy high streets and low bridges.

Although it's good, the system is still no match for a human navigator. The computer will never say: "Turn left at the Dog and Duck" or "Go under the iron bridge". Destinations have to be entered in the zones the computer understands. The system doesn't cater for postcodes although a postcode facility is being planned for the next release.

The computer stores the names of roads, the screen shows the name of the road you are on and the one you are about to turn into, but the system doesn't read them out. This is a shame, as the reassurance would be welcome. The weakest aspect of the system is that it calculates the shortest route, not the quickest, and the computer takes no account of traffic flow. This is fine in a Porsche at 3am, but in heavy traffic, when overtaking is difficult, a link to a traffic database would be a distinct advantage.

The most important element of the

Different levels of zoom allow you to get your bearings

This is the mode you should use when driving along

system is the map. The guidance systems only need to direct the computer to the accuracy of one road junction before the map takes over. The GPS locates the car roughly within 25 metres. From here, it can work out the car's position on the map. If you drive out of the area covered by the map, the arrow merely points directly towards your destination. Once you are on the map, the software looks you up.

The GPS isn't used very often. The compass works out which way the car is facing, so it can calculate in which direction you are travelling along the road.

The system keeps track of how far the car has journeyed down the road by measuring the distance travelled. The normal cable-driven odometer is not accurate enough for this purpose so the system uses the magnets in the anti-lock braking system to measure the revolution of the wheels. This needs careful calibration but can still be fooled. Tyre wear can fool the system — but only until you make the next turn. When this happens, the computer checks to see where you are likely to be — it's only going to be a few yards out — and resets the position. The result of all this is a car which always knows where to go.

● Contact: Tina Withington at Blaupunkt, tel 01895 838547

SILICON FEN — AGAIN...

The UK computer industry was kick-started in Cambridge by luminaries like Herman Hauser and Chris Curry (below). After years in the doldrums, IT is once again raising its head in the land of academia. Phil Jones reports.

Towards the end of the 18th century, a group of Dutch engineers were invited to a corner of eastern England. They were asked to bring with them the water management technology which had tamed the hostile North Sea and created one of Europe's richest agricultural regions. Today, some 200 years later, the land created by that pre-industrial age technology is still as fertile as ever, but it is not just growing sugar beet and

potatoes. Silicon Fen is emerging once again as one of the world's hotbeds of post-industrial age technology innovation and development.

For those of you too young to remember a time before MSDOS and Windows, Silicon Fen (a play on Silicon Valley) was the name given to Cambridge and the surrounding area which spawned some of the most innovative early computer companies anywhere. Names like Sinclair Research,

THE FALL
AND RISE OF
CAMBRIDGE

THE FALL
AND RISE OF
CAMBRIDGE

Acorn, Torch and Cambridge Computers were, in their late seventies and early eighties heyday, every bit as well known as Apple, Altair, Commodore and Intel — US companies which, some still claim, followed a path that had already been trodden by their UK counterparts.

Now, of course, Apple and Intel are billion-dollar giants, and the PC industry is dominated by Microsoft and a handful of other US and Far-Eastern manufacturers. Sinclair Research no longer makes PCs and Acorn is a wholly-

Herman Hauser — "hanging around Cambridge looking for an excuse not to go home" when he met Chris Curry

owned subsidiary of Olivetti, itself a faded star of the PC business. But Silicon Fen is still there. The same conditions which helped to inspire the first generation of Cambridge IT companies are producing a new crop of innovators, and it is these people who may yet drive a renaissance in the UK's high-tech fortunes.

Sinclair and Sillicon Fen
The Silicon Fen story starts in 1978, when Clive Sinclair (now Sir Clive) moved the headquarters of his Sinclair Research organisation to a small office in Cambridge

so that he could be closer to his friends at Cambridge Consultants, one of the first consultancies to take the new generation of digital technology seriously.

Sinclair is unfairly remembered today for the C5 electric tricycle, an under-powered commercial disaster which can still be glimpsed in parts of North London, chained to lampposts, advertising a health club. In 1978 though, Sinclair was hailed as the Isambard Kingdom Brunel of his time. His first company, Sinclair Radionics, started out making small radios in 1964, but Sinclair was one of the first entrepreneurs to recognise the microprocessor's ability to miniaturise virtually any electronic device. In the seventies, he gave the world its first affordable pocket calculator and pocket TV.

By 1977, Sinclair remembers: "There had been a couple of interesting developments in the US. Commodore and Altair had begun selling small computer kits for about $500. I was convinced we could do it for less, and that there would be great demand for a cheap home computer." He was right.

Sinclair was the first developer to take the low-cost Z80 processor and build it into a compact design which, by the standards of the day, was a major step forward. "If you looked at the machines available at that time, you would see that,

as well as the main memory RAM, they also had special fast RAM to run the display and other special display electronics. We made the processor do the whole thing," Sinclair recalls.

Thanks to its innovative design, the ZX80 came to market at just over £100. It was far cheaper than its US competitors, and easier to program. Over the next seven years, the ZX80 and its successors, the ZX81, the Spectrum and the QL, would sell over 11 million units across the world.

Sinclair's claim to have devised the first unified text and graphics architecture is still contested today by Herman Hauser, who, with Chris Curry, co-founded Sinclair's arch local rival, Acorn. Whatever the merits of their opposing claims, Hauser is the first to admit that it was Sinclair's early success with the ZX80 which laid the foundations for what was to become Silicon Fen. "Clive was important in two senses. He came up with the business model which was right for the time — mail order, and he was successful, a winner. He became a role model for the rest of us." says Hauser.

The Sinclair ZX80 was the right product at the right time and, for Sinclair's purposes, in the right place. Cambridge was, and is, home to the flower of UK academia, including the world-renowned Cambridge Labs, and the Cavendish and maths laboratories. So there was no shortage of bright young electronics and computing graduates with the scarce skills needed to build IT businesses. There was also the added incentive of the nearby Cambridge Science Park to grow in to.

As if on cue, the traditionally cold welcome UK academia gave to commerce and industry was just about to run headlong into the Thatcher revolution. Sinclair Research was about to be flattered by a stream of Cambridge-based imitators driven by some of the brightest minds in the UK scientific community.

From little Acorns...
The first, and still the most prominent offshoot of Clive Sinclair's success was to become known as Acorn Computers. Chris Curry and Herman Hauser began the relationship which would found Acorn, the UK's most successful microcomputer

company, after a chance social meeting in Cambridge. "We met in a pub," Hauser remembers. "It was probably either at the Copper Kettle or Shades Bar." Wherever it was, it happened at an opportune time. Curry was looking to leave Sinclair, and "Herman was hanging around Cambridge looking for an excuse not to go home to the family wine business in Vienna," says Curry. They were to prove good foils for one another: "Chris had in-depth knowledge of high-tech manufacturing, I had all the University contacts," says Hauser.

From that meeting, Curry set up Cambridge Processor Units (CPU) which made game consoles, and with Hauser taking an active interest, began development of a microcomputer called the Atom, whose user manual gloried in the title: "Atomic Theory and Practice". The Atom, which cost £149, was positioned against the Apple I, which cost £500, and became the foundation for the first Acorn machine.

Both men are still understandably proud of what they achieved together in under two years, but they did have some good luck along the way. In 1979, the BBC was looking for a machine to be the home centrepiece for an educational series on computing. To Clive Sinclair's lasting disgust, the BBC contacted Curry and Hauser, and the BBC Micro was born. It was to catapult Acorn into the computer industry's fast lane.

The BBC Micro was the first taste of computing for a whole generation. It was a better start than they would have got growing up in California, right next to Steve Jobs' garage. "It was better than the Apple I," says Hauser, who has a knack of avoiding unnecessary modesty without sounding arrogant. "It was twice as fast, and it was the first computer anywhere [although Clive Sinclair would contest this] to have a unified architecture for text and graphics. Everything else was using a separate text node."

It also had some peculiar features which were to prove significant later. Suitably enough for a BBC product, it set new standards for running text and graphics using a TV monitor as the display, plus it came complete with one of the world's first local area network systems, Econet.

Econet was included in the package so that the BBC Micro could be used in

classrooms, allowing the teacher to control what was happening on the different screens. But because of the success of the BBC Micro during the early 1980s, there is evidence to suggest that it had, if only fleetingly, a larger installed base than Ethernet, which was just beginning to be widely used for linking networks of mini-computers and terminals.

It was certainly the first microcomputer-based network of any importance. With the Cavendish Labs becoming interested in it as the foundation for the Cambridge Fast Ring technology, it might have proved a world-beater. But, "We were so far ahead then, we didn't know it," says Hauser. Neither did anyone else. Hauser invited another of the industry's young

Turks to Cambridge to "look at a real operating system" and took the opportunity to demonstrate their network technology as well. "We showed Bill Gates the Econet network and he said 'What's a network?'." *Plus ça change*.

At its peak in the early eighties Acorn was generating an annual turnover of £200 million, and Sinclair Research was making profits of around £15 million on turnover of £120 million. The rises of Sinclair and Acorn were as spectacular as those of Microsoft or Compaq, who were just about to come into their own. Anyone who had invested £1 in Acorn when it started would, if they had sold their shares at their peak, have reaped a return of £1 million (although they would have had to sell their shares quickly). ◆

Chris Curry — developer of the Atom, the foundation for the first Acorn machine

192
PERSONAL COMPUTER WORLD
JUNE 1996

193
PERSONAL COMPUTER WORLD
JUNE 1996

Decline and Fall

In October 1981 IBM had launched the IBM PC, based on the Intel 8088 processor and packaged with Microsoft's MSDOS operating system. When it was launched it cost $1,595, and was far more expensive and no more powerful than machines from Sinclair and Acorn. But the IBM brand guaranteed its success in commercial business markets. Within three months, IBM's PC revenues hit $40 million and by 1984 the company's annual PC revenues were $4 billion.

Almost overnight, Acorn and Sinclair Research became also-rans in what came to be known as the IBM PC business. By 1983 Olivetti had paid £40 million for 85 percent of Acorn, and in 1985 Sinclair Research sold its PC technology and brands to Alan Sugar's Amstrad for £15 million. "We lost our shirt," remembers Curry, who also lost his house. But that wasn't the end of the story.

Although Acorn and Sinclair's declines cast a pall over Silicon Fen's success story in the mid-eighties, their original successes had set up a trend which did not entirely lose its momentum. By the time Acorn and Sinclair were in eclipse, other Cambridge start-ups were making a name for themselves.

In the mid-eighties Ray Anderson,

now another of Cambridge's IT millionaires, set up Torch. Torch was an innovative Unix processor company which would later give way to a more successful venture, Anderson's IXI, which is now part of SCO. In its brief life,

Torch learnt a lot about how to squeeze good Unix performance from a compact design. George Grey, Torch's chief engineer, went on to establish Tadpole Technology, the first company to put a RISC processor (the Sun Sparc) into a notebook format, and still one of the leading vendors of high-performance portable machines around to do so.

The next generation

Nor did Sinclair, Hauser and Curry completely disappear from the scene. Sinclair helped found Shaye Communications, a pioneer developer of cellular telephony handsets. Hauser stayed on with Acorn under Olivetti, becoming the company's vice president of technology and, with Dr Andy Hopper, a reader at Cambridge University, set up the Olivetti Research Centre in the heart of Cambridge. Much of the technology Olivetti acquired from Acorn, including the Advanced RISC Machine (ARM) processor, was kept alive by Hauser and Hopper, and is now helping to drive a second generation of Cambridge start-up companies.

Chris Curry also went on to found new companies, including Key-Line, which was set to become one of the first vendors of electronic cash devices before the banking recession of the late 1980s brought that project to an abrupt halt. Curry is now trying again, with General Information Systems (GIS), which designs the Smartcard devices used in the Midland Bank's electronic purse pilot, Mondex.

Possibly because he was born in Cambridge, Curry is circumspect about what he calls "the foreign influence" that companies such as Olivetti and Hitachi, which has built its own research centre next door to the Cavendish Laboratory, have brought to the city. However, Hauser, an Austrian, sees foreign investment in the city as the key to its revival as a centre of technology, and he believes Silicon Fen must play a supra-national role if its investers are to be able to compete with the Americans.

"Cambridge still has a chance to be a European centre. No other European

At the Olivetti Research Centre, Dr Andy Hopper, together with Herman Hauser, are keeping Acorn technology alive and helping to drive a second generation of Cambridge start-ups

square metre, the materials themselves are much cheaper than LCD screens and can be made to any size. If CDTI can make it work, it could even provide an affordable flat-screen alternative to desktop monitors. CDTI's technology is still in the early development stage, but it has shown sufficient promise to attract new funding and the interest of no less an investor than Apple's former CEO, John Sculley.

All together now...
Perhaps the most immediate prospect for a Cambridge IT revival will come from a

group of companies which are becoming known as the Cambridge Keiretsu. The name derives from their similarity to Japanese companies, which traditionally band together, sharing skills and technologies to help build a market.

Cambridge's Keiretsu is built around Olivetti and Cambridge University, and includes several companies which are spin-offs from Olivetti. There's ATML — an ATM communications specialist,

city has such a concentrated centre of academic excellence as Cambridge," claims Hauser, who believes there is one more barrier it must overcome before the city can fulfill its potential. "Cambridge has succeeded in building £100 million companies; it has still to achieve a $1 billion company."

Pioneering spirit
Hauser believes the roots of the first $1 billion Cambridge company may already have been grown. As well as Acorn, which continues to operate under Olivetti's wing, there are a number of new Cambridge companies which are feeding off Olivetti's research, as well as pioneering technologies on their own.

One such company is Cambridge Display Technology (CDTI) which was set as a spin-off from the Cavendish Lab in 1989. CDTI is developing new display technologies based on light-emitting polymers, a product of the Cavendish's material sciences research which promises to revolutionise screen displays, particulary for notebook and pen-based computers. By using charged sheets of ultra-thin polymer, CDTI expects to be able to produce a screen with greater clarity and faster refresh speed than is possible with conventional LCD screens, while requiring only a 3v current. At an estimated cost of £10 per

OnLine Media — an Internet company and spin-off from Acorn, and perhaps most importantly ARM — the 1993 Olivetti spin-off which has successfully developed the ARM processor and sold it into mainstream products, including Apple's Newton PDA.

Between them, these companies have the skills to make the most of the blossoming commercial interest in the Internet, and with other interactive communications media. Online Media, for instance, is working alongside the BBC, Anglia TV, National Westminster and the Post Office to develop interactive consumer services, while ATML claims already to be a market leader in provision of 25Mb/s ATM switches.

Each of these companies owes a debt to ARM, whose 32-bit RISC processor is starting to win friends as more companies recognise its potential. The ARM processor provides full 32-bit RISC power at one sixth of the price of an equivalent Intel Pentium chip, but requires only a 3v current and comes complete with its own operating system, RiscOS. RiscOS runs in 2Mb of ROM, a technology which costs roughly one seventh of the equivalent RAM.

In a conventional PC arena RiscOS is an obvious disadvantage, but in the new applications which are emerging on the coat-tails of the Internet, this may not matter. As well as already powering the Newton PDA and ATML's ATM switches, it is now set to power the NetSurfer Internet terminal which Acorn has been contracted to design for Oracle, and which is set to launch later this year.

The Internet is changing the rules of the PC game, and Java is waiting in the wings to potentially sever the last hard links between desktop applications and the Windows/Intel platform. As Hauser points out, under these circumstances, the chief factor behind Silicon Fen's eighties decline may no longer apply. Back then, when the world turned IBM blue overnight, "If I had known then what I know now, the world might have been Acorn-compatible, instead of IBM-compatible."

Maybe now Hauser and his Silicon Fen successors will have a second chance, and maybe the new world of IT will be Cambridge-compatible.
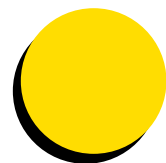
On the CUTTING EDGE

Welcome to Cutting Edge, the section in *Personal Computer World* that combines our regular reviews of games, books and CD-ROMs, with features keeping you right up to date with computing and the Internet.

We now have the most comprehensive coverage of these topics available in a general computing magazine. Stay with us and we'll take the pain out of keeping on the cutting edge.

Screenplay: Future Shock

RADIATION SAFE ARMOR
I'm in the sewers. I'll be at the pickup point in 15

Kids' Stuff: Digby the Dog

Multi-media
The Complete Guide to CD-ROMs, the Internet, the World Wide Web, Virtual Reality, 3-D Games & the Information Superhighway
Books

His first book, *The Whole Internet*, made Ed Krol an Internet star. Here, he talks about his background, the Net and his plans for the future.

The man who sold the Web

Ed Krol

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Daughter: Molly Dog: Sandie

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"THE WHOLE INTERNET" is regarded as the bible for Internet users. Its author is Ed Krol, a man who, in the sixties, went to the University of Illinois to study computing and somehow never left. In 1992, the first edition of this now classic book was published to critical acclaim. *Cutting Edge* editor **PJ Fisher** went to meet him.

PJF: *Computing must have been very different in the sixties. What was the original attraction and when did you discover the Internet?*
EK: "My original fascination was neural network applications but while we were surrounded by computers, I realised then that it was far from a decent way to make a living.

"As for the Internet, I kinda snuck my way onto it and played games — like an old Star Trek game based around Fortran, which we used to play during lunch (some things never change) — we certainly made good use of it at the time!

"I got into mainstream academic computing in '85, when the National Centre for Supercomputer Applications (NCSA) was created. We got a grant award (but no staff) and I became facilities manager. My task was to get the NCSA connected to the Internet, which is where it really all started for me."

PJF: *Did you get involved with the original Mosaic project at NCSA?*
EK: "No. In the early days of the NCSA it was a very jet set kind of life: flying to Washington in the morning for a meeting and flying back again in the evening. It became very wearying.

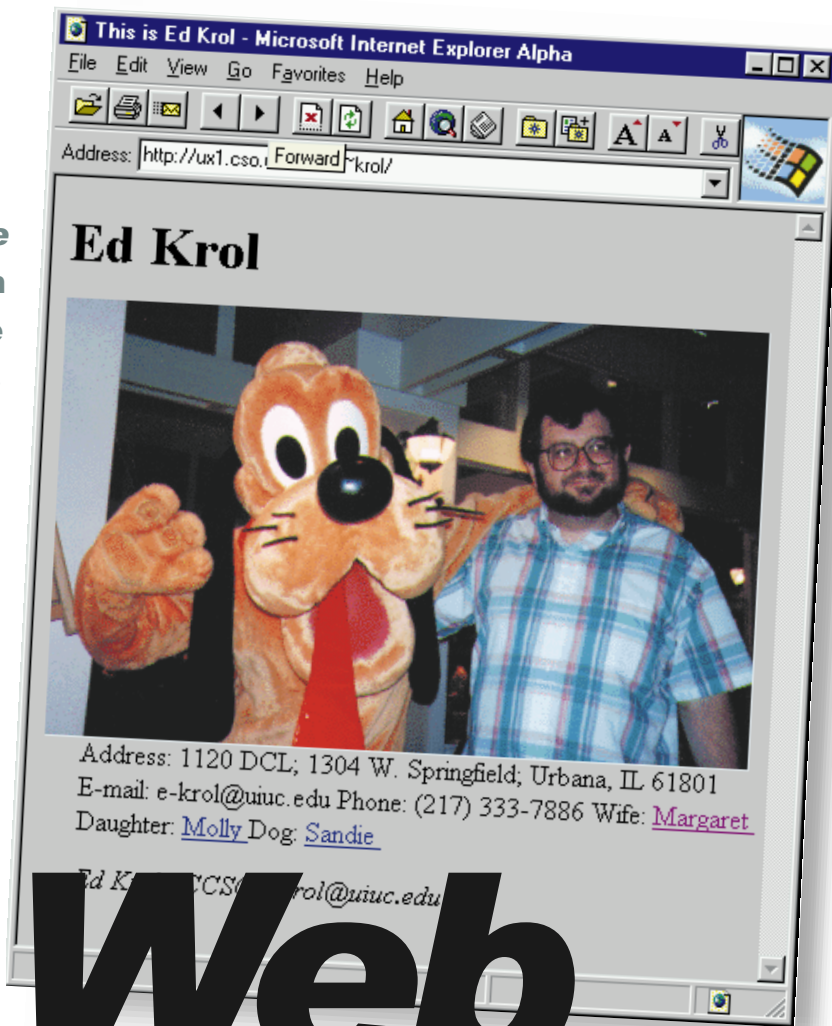"After three years, in 1988, the NCSA staff had the option of returning to the campus: I took up the option so I could be at home more. I had a five-year-old daughter at the time.

"It was only when the first edition of my book came out, in 1992, that I became aware of Mosaic's existence.

"Ironically, when we did the first edition of the book, we weren't sure whether to include the Web because we didn't know what to make of it. We originally decided it was just going to be another Telnet-able resource on the Net; a way of Telnetting to CERN. So we added the chapter on the CERN browser.

"The book went to print when the head of software development at NCSA invited me to a meeting with him and Marc Andreesen in a coffee shop. They told me all about Mosaic and invited me over to play with it."

PJF: *Were you surprised at the success of the book, considering that you weren't even going to include the Web in it?*
EK: "Certainly. My wife thought we would sell 10,000 copies, I thought we'd sell 30,000, and a librarian friend thought we'd sell 100,000. To date, we have sold 750,000 copies in various editions."

PJF: *The book was published in 1992, and this coincided with the surge in popularity of the Web. Have you any idea why that happened when it did after there had been no real change in the technology; no sudden increase in bandwidth, for example? The Internet was pretty much the same as it had always been.*
EK: "Yes, I have a couple of ideas about the reasons for *some* of the growth — I certainly don't have an explanation for the exponential growth.

"1987 is probably the time when engineering students in the US became aware of the Net: and four years later this first generation of Net-savvy students were graduating and went off into industry to spread the gospel there, so that probably had something to do with it.

"And I also think that Mosaic and the Web had a lot to do with it and that Gopher helped, too — the Web caught the imagination of a lot of people."

PJF: *It shows no sign of abating. It's not an explosion that has come and gone — it seems to be accelerating all the time.*
EK: "I certainly screwed up my investments in the Web. I bought and sold my CISCO stock several times. If I had held on to it I would be a millionaire by now, but I was too stupid to do that!"

PJF: *Well, that leads into the current situation where a war for control of the Internet has been developing between Microsoft and Netscape/Sun. Despite the call on all sides for maintaining open systems you get the feeling that the first party to win will close it down. Are you saddened by this, or are you just pragmatic?*
EK: "Not so much saddened by the availability of commercial enterprise on the Net: my view of the Net is one of an 'information spigot' in your home. If I want to find out about vacations in Disneyworld I can do that. If I want prices from Sun I can do that, too, or I can buy stuff. All very nice and convenient.

"I find the Netscape Internet posturing very interesting. It is clear that Microsoft underestimated the inertia of the Internet: suddenly it is just another ISP.

"As for the Netscape attitude that it was going to build an application which you'd never leave and wouldn't care what OS you were running underneath it — well, six months ago Netscape said that was its target. But instead of adding collaboration and text processing to Netscape Navigator, it let Microsoft step in and add it to Internet Explorer.

"So it's an interesting fight, but what bothers me most is that the consumer seems to have been lost in the fray. It seems they are being told: 'You don't understand all this but in another couple of years we'll get all this stuff straightened out and then we can charge you $30 a month and you'll be really happy. But we don't want you to have any input, because you don't understand'."

PJF: *So what do you think all this is bringing to ordinary people? We forget that ordinary people mostly watch TV and make phone calls, so apart from looking up flights and so on (which is a service), what will they get?*
EK: "I think that for a large chunk of the population, which finishes work, spends a couple of hours in the pub and then goes home, probably very little. But those who are interested in communicating in a timely fashion *will* be involved.

"If you have a son or daughter on an exchange visit overseas then you may want to send them an email which is more cost effective than phoning, for instance — it gives you a warm, fuzzy, feeling — and people who have any real reason for getting specific information will be sucked in, too.

"I guess I am a little worried that a move to make the Web all things is going to put off many people. For instance, all these stripped-down PCs, $500 NCs [network computers] which allow you to get on the Web but do very little else…"

PJF: *More hype there?*
EK: "…well, right, are they really any different to Minitel terminals — another version of 'we know what technology you really want'? The Internet is really like the telephone system: we give you a basic means of communication as long as you know how to dial the phone. We are losing the ability to do that with these engineered boxes."

PJF: *A year ago, things were relatively simple, yet we now have these NCs: endless extensions to HTML, none of which have been ratified.*
EK: "And many of them, like blinking, are more of a nuisance than an asset!"

PJF: *And one person's page or site won't work in another's browser. It seems to me that it's getting worse, not better.*
EK: "Very likely it will continue to get worse before it gets better. I don't think Netscape is quite as far out in front as it once was.

"Microsoft is catching up, Lotus is coming up with a built-in browser which does VRML, Java, SSL...

"Netscape had a good idea and is running down the road, but it has to do all the engineering and the software development, whereas anyone else merely has to develop the software if they accept Netscape's de-facto standard.

"Netscape is losing its focus; having to do all this other development work as well in order to take on Microsoft. I think it's a fairly hard road for them."

PJF: *Java is a wonderful idea, but it will be a while before anyone convinces me that it has any serious use. It's just a programming language.*
EK: "And of course, when a new programming language gets designed, it is the one that will supplant all others! But Fortran and Cobol are still around.

"I'm not convinced. I think the concept of applets is a very powerful one but I'm not sure that Java isn't Betamax-format VCR tape: that had Sony behind it but for some reason didn't take off.

"For years, we have been saying to people 'My God, be wary of downloaded software, you don't want to download software willy-nilly — be careful'. Now suddenly, with Java, we're saying 'It's OK! You won't even know it's downloaded, but it's OK, it's safe'.

"There are a number of issues, here: everybody thought Unix was safe but it's full of holes. When Windows NT was released it was supposed to be very solid; now we are seeing a couple of security breaches in it.

"I don't doubt there is going to be some Java application in which the virtual machine [which describes the Java environment] won't be powerful enough to handle that factor, so that machine will have to be re-engineered to make it safer.

"I'm not sure Java is the way to go. Additionally, the current implementations are so slow — the download and execution."

PJF: *And they don't do anything useful, it's just bits of fun.*
EK: "Right. Would you be willing to pay for 30 seconds' service, just to see the coffee in the corner steam?"

PJF: *This whole idea of NCs seems to me to be a backward step: back to mainframes in a different way. The idea of a PC was that it liberated you, it was your personal computer. Now we are telling people "Hey, get rid of all that, we want you to download mini-applications and pay someone $5 for the privilege."*
EK: "I think it's a backward step, too. But I think the marketing tack that will be taken for these $500 NCs will hinge on all those people who buy PCs and never use them because they are so hard to use. But with these

Previous editions of Krol's book sold over 700,000 copies

202
PERSONAL COMPUTER WORLD
JUNE 1996

203
PERSONAL COMPUTER WORLD
JUNE 1996

boxes you just plug them in and they magically work — you don't have to do anything."

PJF: *Let's return to your books. Are you working on anything else?*
EK: "No, but I'm starting real soon. We are scheduled to do a revamp of the original version of The Whole Internet. It will be re-organised like the Windows 95 version was. We thought: 'Well, no-one cares about this Telnet and FTP junk anymore. What people really want is the Web and news'. And we might have to do that to the old version of the book, too."

PJF: *Writing books about the Internet must be difficult now, with technology changing so fast. All things considered, even your Windows 95 version is already out of date, with the stuff on MSN being made obsolete by Microsoft's recent changes. Is that a real worry?*
EK: "Yeah; and we also had the old version of Explorer in the book, and Navigator too. We thought it was good that we did that! Yeah, it makes it hard. One of the things that people don't realise is that the Internet is really easy to use. If you know how to use Explorer, or Mosaic, or Netscape, most of the rest is fluff.

"The bottom line is that even if I look at information in Mosaic, designed for Netscape 2.0, that information is still there but it just looks a little strange. It's certainly quite usable. I can argue, in a lot of cases, that background colouration is not worth the bits that it takes."

PJF: *Do you have a home page?*
EK: "Oh yeah, I had to have one so I put one up. There's not much there!"

PJF: *Will you write any books that are not just about the Internet — wider technological issues?*
EK: "I might. In many ways, the Windows 95 book was the first move into writing about something I was not really familiar with. The first book was quite easy in that I didn't really have to do much research. It was just like a dump of my everyday work habits — I generalised by 30 percent and it was done. But I have never been a Windows person."

PJF: *What do you use as an OS?*
EK: "Ever since desktop computing came into being I have primarily been a Macintosh person, but, you know, you can probably put me in front of *any* machine and I could get by on it, since over the course of time I've used all the big ones: VMS, Unix... If you gave me a Sun Workstation out of the box I could configure it. It might take me all day, but I could do it!

"Windows 95 was pretty amazing because it was so Mac-like. We got a CD of the beta version and the documentation was typically poor and didn't correspond to what was on the CD. But when you clicked on install, it worked. It was pretty straightforward. It tends to crash a whole lot less than Windows 3.1.1. With Windows 95, I only have to reboot maybe once a month."

PJF: *Do you have much time for the OS religious wars? Isn't it all ridiculous? After all, they're operating systems, that's all. And none of them are perfect.*
EK: "Well, if you're looking for OS Nirvana, then OS/2 is probably the pick of the litter, but it's going nowhere. It never picked up enough critical mass to become a viable player. Unix blew it by not standardising. If there had been a single, standard Unix which everybody used before NT came out, I think it could have cornered the market.

"Much of the industry wanted a solid, standard platform and Unix was too busy fighting its little internal wars, so NT grabbed a slice of the market. But I don't think the OS matters all that much in the grand scheme of things."

PJF: *So, finally, let's take the example of a young person leaving college with a computer science degree. What do you suggest they do with it? Are we still living in the age of the programmer as God?*
EK: "Pretty much, but the interesting thing is that if the Web has done anything, it's given jobs to semi-literate computer people.

"The propeller heads have had no trouble getting jobs in the last 25 years but right now there is this whole market for HTML content developers. If you talk to a computer scien-tist, doing HTML is not an interesting pursuit. But there are an awful lot of people who have degrees in English and an eye for layout. What the Web has done is make it a really good market for those people. And you don't have to do much to get experience — get an Internet account, put up a Web page, then go off to a prospective employer and say 'look what I did'.

"But I don't think operating systems are where it's at anymore. Both of the major players are saying that the OS is meaning-less. There is a clue to be taken from that." ◼

the bottom line

There is more to the end of an email than meets the eye. Here's how you can make the most of your *.sig file and sign off with style.

If you look at the bottom of the next email or Usenet post you read, then you may see more than just the name of the writer.

You may see where they work, what they do for a living, their phone and fax numbers, email address, a pointer to a home page on the World Wide Web or an FTP site. You may also find a famous quote, a joke, or a piece of ASCII art.

So what's it all about? Well, this is the signature (or *.sig) which, just like any other, appears at the foot of a communication.

And what's the point of it? The primary purpose of a *.sig has always been to provide information about yourself: answering the question "who wrote this?". Many people stop there. For them, a *.sig is just a list of their details, so that others know exactly with whom they are dealing. Other people view it as a missed opportunity; they see a *.sig as a way to make an email just that bit more personal, or as a way to add a little humour to a Usenet post. Or, as Steven Pirie-Shepherd says: "*.sig files have the potential to be the witty answerphone messages of the cyber-era."

So if you're going to post to Usenet or send an email, why not get a *.sig?

Signs of the times

Fig 1
```
-- d.gilbert--biocomputing--indiana u--bloomington--dgilbert@bio.indiana.edu
```

Fig 2
```
--------------------------------------------------------------------------
This is a temporary, yet nifty, signature.
Will Seay (sea@ibm.rhodes.edu). Just the facts.
```

Fig 3
```
--------------------------------------------------------------------------
Geoffrey J. Barton
Laboratory of Molecular Biophysics, University of Oxford

email: gjb@biop.ox.ac.uk   Telephone: +44 1555 275368  Fax: +44 1555 510454
anonymous-ftp: geoff.biop.ox.ac.uk          WWW: http://geoff.biop.ox.ac.uk
--------------------------------------------------------------------------
```

Fig 4
```
   o      _____            ||Dileep Agrawal     | |agrawald@bates.edu    |
 .][__n_n_|  [ ====____    |                    | |(207) 555-7693        |
 >(_____|__|_[_____]_|Lewiston,  ME 04240__|_|_____|
 _/oo 00000 oo` ooo   ooo ' o^o^o      o^o^o ` ' o^o^o`       o^o^o `
```

Fig 5
```
        ----------------------------------------------------------|
        |Dave Bradshaw davidbd@unix.ubc.ca or 73603.1630@compuserve.com  |
        |----------------------------------------------------------|
        | "When I die, I hope I die like my Grandfather did, quietly in  |
        | my sleep, not screaming like the passengers in his car."       |
        |_____|
```

Words of caution

You should spend some time thinking about the contents of your *.sig. Many people will read it, so be careful what you put there. Remember, the purpose is to provide personal information and a little bit more.

With regard to size, there used to be an unwritten rule that a *.sig should have no more than four lines, although in general this seems to have gone by the board. In any event, short, sharp and snappy are the words to remember.

A cramped *.sig doesn't look good either. If you try to incorporate email, phone, fax, http, ftp, names, addresses and a joke while abiding by the four-line rule, then it will look a mess. You should achieve a happy medium between too big and too

cramped. Don Gilbert's *.sig is evidence that the thought which goes into a *.sig is more important than size. It's a short, but instantly recognisable, one-liner *(Fig 1)*.

How do they get there?

So, you might wonder, how do those people with complex *.sigs get them into every mail and post? They can't be typed in every time; that would take too long and be prone to error.

There are several other ways to make your *.sig available every time you post. You could keep the text in a separate file and copy the contents each time. But better than this is to have your *.sig put in automatically. Most newsreaders and mailers

have this facility. You define the source *.sig file, which is then automatically included with every mail and post.

"Just the facts"

(B. Willis, Die Hard 2)

One of the main things you'll want in a *.sig is your name and location. If your main Internet access is at work, you may want to include your office address (but see *Disclaimers*, below).

If your main access is at home, you may not want to show your full address; so just use the name of your town. Many *.sigs have the author's snailmail address, phone and fax numbers. Or, you could follow Bruce's advice and provide the facts, without the fax *(Fig 2)*.

Pointers

Just like a life form, *.sigs evolve and they do it pretty fast. Recently, more and more are carrying pointers to home pages on the Word Wide Web or an FTP site from which useful (or useless but interesting) files can be downloaded *(Fig 3)*.

ASCII art

ASCII art is produced merely by using the 128 characters in the ASCII character set. It's amazing what can be done with only a few slashes, dashes and lines. You may want to depict your hobby, or just show what you can do using simple materials.

It's in this section that the skill of keeping the *.sig small and under control is important.

The most impressive pieces of ASCII art are those which depict an image with minimal use of characters and space. Dileep Agrawal has worked hard to avoid the pitfalls, and has created a great *.sig *(Fig 4)*.

A joke

One way to get your *.sig noticed is to include a joke. It should be short and sharp, otherwise your *.sig will get too big — one-liners fit well into *.sigs *(Fig 5)*. Be certain that it will offend no-one, ever. Think carefully before committing a joke to your *.sig: the Internet is used by people of every race, gender, sexual orientation, religion and disposition.

A quote

If you have a favourite quote from a film, a book, or some great philosopher, your *.sig is a great place to share it with others. Just remember, though, that anything controversial in a *.sig will cause you problems. Some people who've trod the path of choosing a quote are shown in *Fig 6*.

It doesn't have to be a real quote; you could modify a well-known one to make it funny. But don't be tempted to make up a quote which you want to go down in history: unless you're a philosopher, or hit lucky, the only thing it'll go down in is flames *(Fig 7)*.

Disclaimers

Another common feature finding its way into the humourist's *.sig is the disclaimer.

There are many variations of the standard, "these are my opinions, not those of the company" type of disclaimer. This is currently one of the growth areas in *.sigs, as more people create unusual variations on a theme *(Fig 8)*.

So get thinking about those *.sigs. If you've got a good one, please do send me a copy.

Bob Lauder

● Bob Lauder can be emailed on r.lauder@lancaster.ac.uk

Signs of the times (cont'd)

Fig 6

```
*************************************************************************
* John Alsobrook    Child Study Center    Yale University School of Medicine   *
* internet: alsobrook@biomed.yale.edu / bitnet: alsobrook@biomed.bitnet        *
*--------------------------------------------------------------------------*
* "Giving money and power to the government is like giving whiskey and car     *
*  keys to teenage boys." -- P.J. O'Rourke                                     *
*--------------------------------------------------------------------------*

Dr. Jim Offord               |There is more to life
Parke-Davis Biotechnology    |than increasing its speed.
offordj@aa.com               |
Opinions? They're all mine.  |Mohandas K. Gandhi

**********************************
*    Charles T. Faulkner      *  When you don't know where you're
* Univ of Tennessee, Knoxville *  going any road will take you there.
*   (ctfaulkn@utk.utk.edu)     *                      Alice
**********************************

------------------------------------------------------------------------
In American politics you ask the rich for money and the poor for votes and
       expect them both to believe you.  A. Lincoln
----------- Jack Warner  jwarner@freenet.columbus.oh.us -----------------
```

Fig 7

```
Eric Sybesma, Unisys     | sybesma@uniras.rsvl.unisys.com | (612) 555-3380    |
Site Management Products | "One in the hand is better than two in the bush,   |
Roseville, MN 55113      |  unless, of course, we are talking about thorns."  |
```

Fig 8

```
* Derek M. Harkins <harkinsd@sol.fiu.edu>  | All opinions here stated, if *
* United States Department of Agriculture   | correct and lucid, are solely*
* Agricultural Research Service   NCGR-MIA | my own.  All others you can   *
* Miami, FL 33158   USA   (305) 555-9321  | blame on my evil twin.        *

* Dennis Stockert        My opinions may not qualify as "intellectual"
* stockert@lerc.nasa.gov    property; but they're mine - and mine alone
```
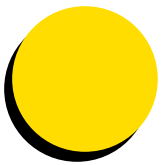
net.newbies

Getting started on the Net: what to do, where to go

These pages are designed to be an easy-to-use reference guide to the Internet for the novice.

So what is the Internet?

The Internet consists of millions of computers interconnected in a global network. The number of users is difficult to measure, but those worldwide who can at least exchange electronic mail messages is estimated to be 30 million and growing.

What about this World Wide Web then?

It is *not* the Internet. It is a service on the Internet which uses special software known as Web Browsers (usually available free) to give users access to pages of information with pictures and multimedia instead of just text. About 15 million people around the world have access to the World Wide Web.

Sounds great. What do I need to get on?

A PC of almost any age can be connected to the Internet as long as you can plug it into a modem. You don't even need to be able to view graphics on your machine to look around (although it helps).

A modem allows your PC to dial in to another computer with a modem and communicate with it. They come in different speeds, from 2,400 baud to more than ten times that. When you are using the Internet, the speed at which things work is more likely to be limited by the speed of your modem than by that of your computer. Buy the fastest you can afford. An old 2,400 baud "V.22bis" model is fast enough to exchange electronic mail messages, but to send and receive files, or use the more exciting services on the Internet, a modem which runs at a speed of at least 14,400 baud "V32.bis" is vital. Fortunately, these have plummeted in price over the past few years and now cost as little as £100. If you have the money, go for a 28,800 baud V.34 modem. Over time, you'll recoup the added cost by reducing your phone bills.

Okay, I've got a modem. Now what?

For a modem to bring you information, it has to have a number to dial. This is where a "service provider" comes in — you have to subscribe to one if you want to get online. Whatever kind of connection you have set up, you will have to pay your phone costs on top of any subscription, unless you are lucky enough to get free local calls through a cable company. The bigger service providers will have the numbers you dial, PoPs (points of presence), scattered across the country so you only have to dial a local number.

If there's no company near to your home which offers Internet access, you may have to pay long-distance phone rates. Once connected, though, it doesn't matter where the information you are accessing is physically located: you are always charged at the same rate. A list of providers and telephone numbers is available in the panel below. For more details, have a look at the supplement banded with the January issue of *PCW*.

Full Internet access, which allows you to use email and Internet services for any amount of time, limited only by the size of your potential phone bill, costs more, currently between £8.50 and £15 per month. There are dozens of companies offering this kind of Internet access, none of them big enough to dominate the market. The basic service being offered is largely the same, although some higher-priced providers may claim to offer a more personal service or a better selection of access software.

Why don't I just join CompuServe?

Or you could try AOL, Europe Online, UK Online and MSN who all now offer Internet access and also have a large number of services of their own to which only their subscribers have access. These services include official technical support for hardware and software by electronic mail, online games, vast indexed software libraries and databases of business or consumer information. A monthly subscription tends to cost between £5 and £10 per month, plus a charge per hour if you are online for more than a set number of hours in that month. But as the market becomes more competitive prices are falling — CompuServe has announced some significant reductions.

Demon Internet is the best known and most popular of the standard Internet operators but doesn't cater too well for beginners. Perhaps better for the raw newbie is Easynet (although it only has PoPs in London and Edinburgh) or UK Online. The latter is a special case; a cross between an Internet provider and an online service. For £8.50 to £12.75 per month it offers unlimited access to the Internet, partially "censored" to make it safer for children to browse, plus access to online magazines and other services.

Any good service provider should provide you with appropriate access software when you sign up, and if you want to choose something different, most of it can be acquired online, free of charge.

CUTTING EDGE

net.news

Around the Web world, with PJ Fisher.

Font fight is the new browser battle

Microsoft
typography
http://www.microsoft.com/truetype/

Netscape and Microsoft have each fired off their first salvos in a new browser battle. This time, the prize is for who can convince the most users that its browser technology has the best fonts.

As usual, Microsoft is going it alone by promoting an extension of TrueType technology for the Web, while Netscape has teamed up with Adobe to build HTML extensions which will support Adobe Type 1 fonts as well as TrueType, within Navigator.

TrueType was originally developed jointly by Microsoft and Apple as a way to combat Adobe's monopoly of the desktop publishing market. The battle has come to the Web now that designers are crying out for ways to create good-looking Web pages.

Microsoft has a short lead over its rivals. Internet Explorer 2.0 already supports a limited number of TrueType fonts within the browser, as long as those fonts are present on the client PC and are supported by an HTML tag. This has recently been extended to the Mac version of Explorer.

The Netscape camp is promising much: anti-aliased type, embedded and compressed fonts that are sent with the Web page, progressive rendering of fonts and font subsetting which, it claims, improves performance because only those characters needed are downloaded.

The technology is based around an enhancement of Adobe's Amber technology which enables Acrobat documents to be read within the Netscape browser.

Microsoft is extending the work it has already done by letting Web designers create pages around a core set of TrueType fonts and then send them to any platform. Like Adobe, Microsoft will embed fonts within HTML. Supporting this, Microsoft is to introduce a royalty-free cross-platform licensing program for the TrueType rasterizer which will bring TrueType to platforms (such as UNIX) that previously did not support TrueType.

To protect type designers, type manufacturers can specify embedded fonts to be read-only or to be fully-downloadable to protect intellectual copyright.

Microsoft is to make the core set available to Web developers and will include designs from top type designers, including Matthew Carter. By licensing the TrueType download technology to other browser and application developers it hopes to unlock thousands of TrueType fonts for the Web.

Both camps are proposing their font technologies to the World Wide Web consortium for approval as extensions to HTML but undoubtedly, neither will wait on approval for implementation.

Although considered inferior in quality to PostScript fonts, TrueType has been successful with over three billion fonts sold.

Hedging its bets, Adobe has recently announced that Amber will also be supported in Internet Explorer 3.0.
http://www.microsoft.com/ truetype
http://www.adobe.com

Sony PC for the US

It has often been said that if Sony were to ever seriously apply its vast resources to making PCs, then the giants in Silicon Valley would really have something to think about. Witness the success of its PlayStation consoles since they were launched last year.

For years, however, Sony has shown very little interest in the PC market, making only monitors and other peripherals.

But news that Sony is developing an operating system to run on its own network computers could change all that. The company is also developing motherboards in conjunction with Intel, boasting "new generation" video and audio capabilities for a Sony PC to be released in the US this autumn.

Sony COMPUTER PRODUCTS GUIDE

Parent-power on the Web

Parents concerned about their children accessing porn on the Net may soon have a ratings system to help allay their fears. Microsoft has joined forces with the (US-based) Recreational Software Advisory Council (RSAC) to enable a Content Advisor feature which will be included in the final release of Internet Explorer 3.0.

According to Microsoft, this will make it easier for parents to monitor what their children are viewing on the Web and other parts of the Internet.

The new system has been developed from The World Wide Web Consortium's "Platform for Internet Content Selection" (PICS) guidelines. These are designed to allow content providers to label, voluntarily, the content of Web sites. Used in conjunction with existing parental control software such as SurfWatch or NetNanny, parents can regulate what their children see via a rating system similar to that used on video tapes. X-rated sites would, for example, be immediately blocked by the browser.

Microsoft is setting up a Web site which will detail in full how the system will work and will advise on existing parental control methods.

PICS itself believes in self-regulation and is against the blanket ban on anything deemed "unsuitable" by governments. Instead, it urges parental guidance.
http://www.microsoft.com/ie/ parents.htm
http://www.w3.org/pub/WWW/PICS/

PICS

Navigator 3.0 released

Just as Microsoft releases an alpha of its Internet Explorer 3.0, Netscape has quietly released version 3.0 of Navigator. Nothing revolutionary: just support for Live 3D, a VRML viewer and a plug-in for playing inline AVI, WAV and MIDI files supported by HTML. This only works under Windows 95 or NT. Macintosh users will be able to run Java applets, at last.

An add-on application called CoolTalk allows users to use the Web for conducting telephone conversations and data conferencing via a 14.4Kb/sec modem. A whiteboard facility is also available using CoolTalk. The alpha is free to download for a 90-day trial period from Netscape's Web site.
www.netscape.com

Mirror Group goes with AOL

● Unlike other newspaper publishers the Mirror Group, including the *Daily Mirror* and *The Independent,* has chosen to go online via AOL.

In the belief that this will "attract a new group of readers and users" the group's other titles, including *Sporting Life,* will follow at a later date.

Elements of L!VE TV, also part of the Mirror Group, are additionally promised although the company did not specify which. Perhaps we might see the new bikini-clad weather girls next to the animated AOL weather maps?

214
PERSONAL COMPUTER WORLD
JUNE 1996

215
PERSONAL COMPUTER WORLD
JUNE 1996

Net.surf ▽▼▼▽

Swatch this
Swatch has brought its colourful approach to watchmaking to the web with its new site. There's plenty to keep you amused including a gallery of Swatch art, information on highly collectable Swatch watches and an in-depth look at Mr Nam June Paik, billed as the "father of video art". His new design for Swatch, based around "Internet Love", is described in full Technicolor detail.
http://www.swatch-art.com

The French correction
Need a shave? Perhaps you should drop into the Daniel Rouah Barber Shop & Skin Care Salon. Not only is Daniel "the barber to the stars" but he also claims to be the first barber in cyberspace. And who's to argue? Billed as a "Frenchman With a Razor and a Mission", Daniel is frankly appalled at the way British men shave. So tomorrow morning surf over to Daniel's web site on tips on how to do it properly. Or better still, be like me and don't bother to shave at all.
http://www.blu-chip.com/ drouah

It's a breeze
The latest trend among radio stations is to start broadcasting over the net: witness Virgin's much trumpeted launch last March. Not to be outdone, two Essex-based commercial stations, Breeze FM and Essex FM, have launched web sites. They don't seem to have heard of RealTime Audio but you can listen to an exciting jingle.
http://www.breeze.netforce. net
http://www.essexfm.netforce. net

The (unauthorized) Princess Diana Page

Cor! What a Di-full!
Any site that opens with the words "She may be a head case, but she's easy on the eyes!" has got to be worth a mention. But to whom does it refer? Why, none other than the lovely Diana, PoW. This unashamedly trivial site has got all the links that any patriotic citizen should know about the woman who refused to play the monarchy game.

Shame the site itself isn't too easy on the eyes.
http://user06.blue.aol. com/douglasb52/index.html
PJ Fisher

IBM Web server give-away

IBM is entering the Internet fray even later than Microsoft but hopes to attract people to its new server software by giving it away via its Web site.

The IBM Internet Connection for AIX and OS/2 Warp is available now and will be followed by an NT version. Apart from the standard Internet protocol, the new server will support IBM's proprietary protocols to enable corporate databases to connect to the Internet or form part of company Intranets.

The new server is designed to compete head to head with Microsoft's Internet Information Server as both companies are trying to leverage market share from the NCSA (National Centre for Supercomputing Applications) .
http://www.ibm.com
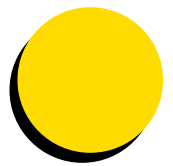
Quarterdeck grabs Datastorm

Quarterdeck has been on the acquisition trail again with its purchase of Datastorm Technologies, developer of Procomm Plus, one of the first comms suites for Windows users. This was recently updated to take advantage of Windows 95 and the web.

As Quarterdeck already sells its own Internet and comms suite, the acquisition seems puzzling. But Quarterdeck also signed an "intent" to acquire Future Labs which develops whiteboarding and collaborative technology.

Quarterdeck says it hopes to combine technology from both companies to push into the collaborative computing markets.
www.qdeck.com

Barclays banks on the Net

Since announcing its development of Internet banking via Microsoft's Money home accounts software, Visa Interactive has named Barclays Bank as the first UK financial institution to develop the system for its customers. In the US, more than 30 banks have signed up to the system.
http://www.visa.com

Take five steps with Corel Web database

Corel has announced a new database package for the Web. CorelWEB.DATA will allow companies to publish database information directly to their Web sites.

It is Windows 95 and NT compatible and uses extensions to Netscape 2.0 or Microsoft Internet Explorer to publish catalogues, phone lists or other data via the Common Gateway Interface (CGI) protocol.

Corel claims that the process is completed via a simple five-step procedure that begins by selecting the type of database, and finishes by hitting a Process button which converts the database information directly into HTML.

Graphics and hyperlinks can be added along the way and databases can be merged into existing Web pages. A 30-day free trial version is available from Corel's Web site.

Corel has also released WEB.GALLERY, a CD-ROM of over 7,500 "Web-ready", copyright-free images including backgrounds and bullets.

Corel WEB.DATA will cost around £169 and WEB.GALLERY about £79.
www.corel.com

Gates proposes PC control

Remember Microsoft At Work? The long-forgotten Gatesian idea of linking office faxes and photocopiers with PCs has resurfaced in the shape of Simply Interactive PC, an idea outlined by Bill Gates at the Windows Hardware Engineering Conference in San José, California.

This time, your PC is being tipped to control other gadgets in the home such as the TV, stereo, VCR and other unspecified domestic "electronic devices".

Much of what was said was at proposal stage only but Gates believes this is one way of maintaining PCs as the dominant force in computing against the threat of the new Network Computers (NCs) from Oracle, Sun and others.

Firmed-up ideas did, however, include the announcement of (real) plug-and-play connections for VCRs and camcorders, and a Universal Serial Bus for instant hook-up of office devices such as scanners and printers.

Of more interest is the "On Now" technology which is intended to remove the long bootup procedure from PCs, making them more like other consumer devices with instant switch-on. This differs from sleep mode found on some current PCs by IBM, for example. Also promised is "easy access" to the Internet and even step-by-step ISDN networking.

According to Gates, these new PCs would be small, sealed, boxes inaccessible to users but upgraded or added to by plugging in other components, much like separate audio systems. Peripherals of all types would configure themselves automatically to these new slimline PCs. The Microsoft boss believes they could sell for around $500.
http://www.microsoft.com

UK Java centre set up

Java is definitely here to stay and the first UK-based Web site has been set up, devoted to this increasingly popular programming language.

Independent from Sun Microsystems, it intends to become a resource and discussion centre for UK-based Java developers. There will be details of tutorials, exhibitions and events in the UK.

A Golden Duke award, voted by visitors to the site, will be given to outstanding applets on a monthly basis. Other sections include the J Files, a resource of Java applets, and Ask Dr J, an advice centre.
http://www.java.co.uk

Price wars

Global Internet has announced what it claims is the best value ISDN Internet access service in the UK. At £7.50 the tariff is identical to its dial-up modem service.

"No other Internet company is able to offer such a good value ISDN tariff," said managing director, Laurence Blackall.

UK Online is to make its online service and Internet access available via ISDN at a flat rate of £14.99 per month with no extra charges for time online.

Planet Internet will be offering unlimited access to users for £12.50 a month. The company is committed to introducing its free 0800 access this month.
● **Global Internet**
0181 957 1008
http://www.globalnet.co.uk
● **Planet Internet**
0171 345 4000
● **UK Online 01749 333300**

net.answers

Nigel Whitfield guides you through the Internet.

Is Big Bill watching you?

Q: I heard a rumour that when you connect to MSN, a check is made on all the unlicensed software you have on your computer. It is worrying to think that this could be happening; after all, surely this is an infringement of privacy?

Have I just been told a silly story, or is it true? Does "Uncle Bill" really know what's on our PCs?

A. Leaving aside the fact that having unlicensed software on your computer is pretty close to theft, there's not much to worry about. It's been widely rumoured on the Internet, and elsewhere, that the online registration for Windows 95 or for Microsoft Network reports your system configuration, but there's only a small element of truth in the story.

If you opt to register online, you will be asked whether details of your Microsoft software can be sent as part of the registration process. If you have unlicensed Microsoft programs, details will be sent too.

But no information is sent unless you click on a button to allow it, and you don't have to register online — you could send in the registration card instead.

Microsoft Network does not record details of your system and send them over the wire, either, though it will automatically upgrade itself if you are using old MSN software on your computer such as, for instance, Pipex Dial.

Despite widespread rumours of this sort, no-one has ever proved that information is being sent from your computer without your consent when you use Microsoft products, and Microsoft has denied it. In short, this rumour is like so many of the stories that you hear on the Internet, just another urban legend. Don't worry about it.

Forming an attachment

Q: Whenever I send an attachment, the receiver always gets its x's and 1's all over the page, as if it has been opened along the way. Is there any way of fixing this, and sending attachments properly?

A. Without knowing what sort of email program you're using, it's hard to give a definitive answer to a question like this, but there are some basic guidelines for sending attachments from one system to another.
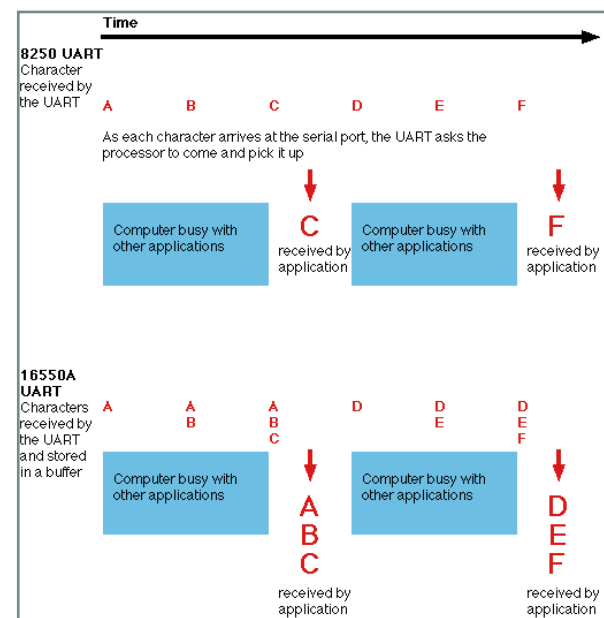
Firstly, make sure that both the mail programs can use the same format for exchanging attachments — such as MIME, BinHex or UUencoding. If you can't find a format that both programs support, you'll have to use a separate program such as WinCode to encode files that you want to send. You can include the encoded version of a file into your message, just as you'd include a text file. At the other end, the recipient will have to save the message as a file and use the same program to decode it.

If you still have problems, there are a number of things you should check when you send a message. Firstly, send a copy to yourself and see if you can decode it; if you can't, there's a problem with the encoding program. Secondly, find out which systems your message is passing through. The names of the systems appear in the headers of the Received message, and if you see references to systems such as X400 or

Urban myths — Microsoft Network and Windows 95 don't report on all your software. But that's still no excuse for having unlicensed programs on your system

cc:Mail, it's likely that your mail is going through some sort of gateway computer, and that is very often the cause of problems like yours.

MIME relies on special headers in the message to say what type of attachment you're including. Some of the gateways that are used to connect corporate email systems to the Internet still don't understand MIME or some other ways of attaching files to messages. In the case of MIME, if the special headers were deleted, the resulting message would contain just the encoded version of the file, looking like gibberish.

Other gateways corrupt certain types of file — you can't use UUencoding to send a file through a BITnet gateway, for instance, as any ~ characters will be corrupted; while some simply throw away attachments they don't understand. Remember, too, that while your mail program might show you an attachment as a cute icon in a message, if it's not using MIME, there won't be any special headers to tell the recipient about the file and they will see what appears to be random text, unless their email program automatically detects non-MIME attachments

The best advice if you have problems is to try different ways of sending your attachment. If you can use MIME, do, but otherwise try UUencoding or, if you know your message is passing through a BITnet gateway, use something like BTOA encoding (which we discussed in a previous column).

Serial port speed test

Q: I have recently bought a Motorola V.34 modem, which seems to be working fine.

This is a PICT file of something I drew to try to illustrate the difference between a 16550A and a 8250 UART

However, I recall reading some time ago that it is advisable to buy a connector which will speed up the data transfer through the serial port to which the modem is connected. I can't find any reference to such items in recent magazines. Is this still an advisable thing to do? Can I test the speed at which my serial port works? I have a year-old Gateway 75MHz Pentium.

A. What you need to speed up your modem is not a connector, but a whole new serial port. Whether or not it's worth upgrading depends on the age of your computer and the type of port it's already fitted with.

The critical component in your PC's serial port is the UART chip (Universal Asynchronous Receiver Transmitter). This is the chip that receives information from the serial port and provides it to the rest of the computer. Many PCs use a chip called the 8250 (or a close relative, the 16450), which was used in the original IBM PC. While this is fine for older modems, it simply can't keep up with a modern, fast modem. The problem is that it can only remember the most recent character to arrive through the modem: when that information arrives, it asks the PC to come and pick it up. But with a fast modem, more information might have arrived before the PC is ready, especially if you're running more than one program at a time, and so data is lost. Since modems have error correction, this is not the end of the world, but it does mean that things slow down as data has to be retransmitted.

Modern systems — including most Pentium PCs, and all the ones with the Triton chipset — are often fitted with a newer chip, the 16550A. This does the same thing as earlier UARTs, but it can remember up to 16 characters, allowing it to work much faster and not to lose information while it waits for the PC to respond: though on a very busy computer you might find that even a 16550A isn't fast enough.

Another alternative is to buy a more

2 2 0
PERSONAL COMPUTER WORLD
JUNE 1996

2 2 1
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Foreign accents

Q: I have been trying to send email messages in French, but the recipient is never able to resolve the letters with accents. Instead, they see one or two entirely different non-accented characters in place of the intended character. Is there an easy way to solve this problem? My mail tool is Eudora Light v1.5.

Q. When I compose messages using Exchange and see them appear on some mailing lists, lots of the lines end with =20. How can I stop this from happening?

A. Both of these problems are caused by the same thing — a type of encoding system used for email called "Quoted Printable", which is often found in mail programs such as Eudora, along with other MIME features.

The email system on the Internet was designed as a way of sending 7-bit messages, using the standard ASCII character set. That means you can send letters, numbers and basic punctuation for American English: there isn't, for example, a standard ASCII code for the £ symbol. As the Internet has grown, many people want to send messages in foreign languages, but the standards for mail are still only 7-bit, with very few systems understanding anything else.

As a result, you have to use special ways of encoding extra information, using systems such as MIME. The "Quoted Printable" format is one of these systems, and is designed to make sure that most of a message is readable whatever type of mail program you use, with only the special letters and characters encoded. Encoding is done by using a = sign, followed by two letters or numbers that represent the code number of a special character in hexadecimal. For instance, you'll often see "=A3" in messages, which is the Quoted-Printable way of saying "put in character 163" here, which will usually produce a £ symbol when the message is read in another mailer that understands the format. If a recipient is seeing odd pairs of letters instead, it's likely that their mail program doesn't understand Quoted-Printable.

The only real solution to this problem is for both people to use a program such as Eudora, which will work properly. If you

know that all the systems your message will pass through are capable of handling 8-bit messages, then you might be able to avoid using Quoted-Printable, but it will be a rather hit-and-miss affair.

The second problem, where lines end in =20, is easily resolved. You'll often find that if you press the Enter key when a line is becoming long, rather than allowing your email program to move you to the next line automatically, the =20 won't appear in your messages.

What's actually happening is that when your typing reaches the right-hand side of the compose window in a program such as Exchange, and you move on to the next line, a new line is put into your message but preceded by the code for a space, "=20". When a similar mail program reads it, it interprets the sequence as meaning, "This is really all one line, but it was split up to fit in the window". A mail program that understands Quoted-Printable messages will display everything properly and can reformat the message to fit the window it's displayed in, but other programs will have new lines where the original mailer wrapped them, and =20 on the end of each one.

If your mail program understands the format, but you see the symbols in messages you receive from mailing lists, it means that somewhere along the line, the MIME headers that tell mail programs to use Quoted-Printable have been lost. As with other special features, if you don't know that everyone you write to can understand them, you should turn them off in your mail program.
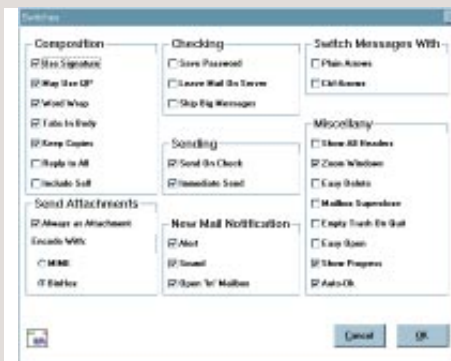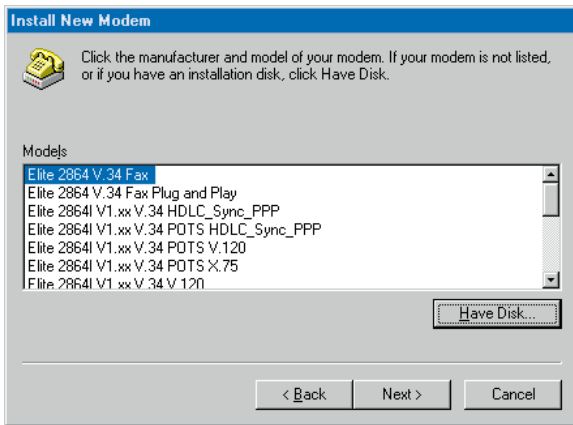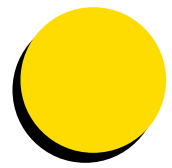

If you don't want to see lots of "=20" in your mail messages, make sure that you turn off the Quoted-Printable option

sophisticated serial port, such as the Hayes ESP card or a Digi serial controller. Cards such as these have their own on-board processors and can work much faster, but

they'll typically cost from £150 upwards, whereas a simple serial card with a 16550A costs about £50.

If you're running Windows 3.1 you can

CUTTING EDGE

Install New Modem

Click the manufacturer and model of your modem. If your modem is not listed, or if you have an installation disk, click Have Disk.

Models

Elite 2864 V.34 Fax
Elite 2864 V.34 Fax Plug and Play
Elite 2864I V1.xx V.34 HDLC_Sync_PPP
Elite 2864I V1.xx V.34 POTS HDLC_Sync_PPP
Elite 2864I V1.xx V.34 POTS V.120
Elite 2864I V1.xx V.34 POTS X.75
Elite 2864I V1.xx V.34 V.120

Have Disk...

< Back   Next >   Cancel

If you want to connect to the Internet using ISDN, you'll usually need a modem and driver that support Synchronous PPP

find out what sort of serial ports are fitted on your computer using the MSD diagnostics tool, which is in the Windows directory. There's no similar command in Windows 95, and you can't tell by looking at the Hardware properties for your serial ports as the information displayed is identical regardless of the type of UART chip in your PC.

As a general rule of thumb, a system built in the last year is likely to have fast serial ports, especially if it's a Pentium. In many cases, the UART chip itself doesn't exist as such, but is built in to the motherboard chipset or the chips on the disk controller. If you want to add a new serial card to increase the speed, check to make sure that

you can disable any built-in ports, or that you can buy a card with a wide range of interrupt settings. Cheaper cards aren't always easy to configure if your system already has two serial ports.

Setting up ISDN

Q: My Internet provider says I can connect to them using ISDN instead of a modem. Do I need a special piece of equipment to do this?

A. Yes. You can only connect via ISDN using a special piece of equipment called a Terminal Adaptor (or TA) which links your computer to the ISDN line. Unfortunately, there are several different ways that two terminal adaptors can talk to each other,

and if your TA doesn't support the right format, then you won't be able to connect.

Many Internet providers in the UK use similar equipment to provide their services via ISDN, and unless your provider tells you otherwise, you'll need a terminal adaptor that can support Synchronous PPP via a standard serial port. That's sometimes called "HDLC Synch PPP" and it means you can use your existing Internet software to connect, and your existing serial port, which is "asynchronous." The difference is that in a synchronous connection, data is transmitted all the time, so one system doesn't need to signal to the other when it's starting to send, and there's less overhead in communication.

Unfortunately, most PCs don't have a synchronous port — though you can buy one for a price. Instead, you'll need a TA that can convert data between the two formats automatically. A growing number of external TAs can do this, but it's much easier with an internal ISDN card. When you're shopping for a new TA, make sure that this feature is included, because it's likely to

become more important over the coming months. If you can't find one that does support synchronous PPP, make sure that you can upgrade it later.

If you use an external TA, you'll usually have to tell it that you want to communicate in PPP mode, then you'll be able to use the same software as you would with a modem. Check with the Internet provider, as there may be other differences. For instance, when you make a modem connection to Demon Internet, you have to enter your user name and password before starting a PPP connection; but when you connect via ISDN, you use the PAP password system built in to PPP. If your PPP software doesn't support PAP, you won't be able to connect. ▣

PCW Contacts

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nigel@stonewall.demon.co.uk
If you have questions you'd like answered, please send them to **net.answers@stonewall.demon .co.uk.**

Please note that a personal response to every query cannot be guaranteed.
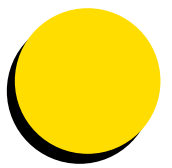
Innovations

How did they do that?

The DMF disk format not only reduced Microsoft's costs, but also generated the benefit of piracy protection.

IF YOU'VE BOUGHT ANY OF Microsoft's recent business software on floppy, you may well at some stage have used File Manager to look at the disk and discovered a file size well in excess of the 1.4Mb that you would normally expect to see. Access 96, for example, clocks in at 1.67Mb per disk and to quote a well-worn phrase, how do they do that?

As many people know, 1.4Mb disks are often confusingly promoted as 2Mb. This is because if you were to record one long stream of data onto the disk, with no clusters or any other formatting, then you'd be able to get two million zeros, or ones, recorded onto it. But PC data is written in blocks and the drive must be able to identify those blocks.

To make certain the drive knows where the blocks start and finish there has to be a substantial guard-band of unused data placed between them. Without the guard-band, or using a very narrow guard-band, you would find that each time you stopped and started writing data, the blocks would begin merging into each other. It wouldn't then be possible to read a file with any reliability — especially on drives that were old, or less than perfectly set up,

Because the floppy disk system has to work reliably across a huge range of drives (of completely unpredictable quality and age), the guard-band has been made big enough to cope with all but the very, very worst of

drives. This is why, despite the millions of floppy disks worldwide being repeatedly written and over-written, there are few write/read problems ever caused by the format itself.

The down side of the guard-band is the overhead: the wastage of capacity that it entails. In total, 0.5Mb is lost — a quarter of the disk's real capacity. For the home or office user this is more of an inconvenience than a real cost problem — it would simply be nice to squeeze a few more files onto each disk.

But for Microsoft, and any other really large retail software organisation, this waste of space represents a significant cost. If you are publishing several million disks a year, increasing the capacity of each by even 20 percent will save a lot of money.

So Microsoft returned to the drawing board and saw that what it was doing with floppy disks was quite different to the normal way they are used. As a publisher, the company is only producing disks as a read-only

format, where all the files are written in one go. The data is virtually sprayed onto the disk in one long stream, with the duplicator doing a bit-by-bit copy from a master image held in a solid-state memory.

So, there is no need to format the disk with large guard-bands because files are not being put onto the disk as separate entities. In fact, most of these normally contain only one large, compressed file anyway.

And once the disk gets to the consumer, because it will be used as a read-only disk, there is no need for the large guard-band to be built into the formatting.

Since the guard-band is there to ensure that repeated write/reading is reliable, just reading the pre-recorded disks has not proved problematical. Although there were initial fears that some old drives would not like the DMF format, return rates for DMF floppies are actually lower than for ordinary DOS formatted drives.

The main driving force

behind the DMF format was the need to cut down on the number of disks in each software pack, so reducing the cost and making it a little easier for the consumer to load. But once the DMF disks have got out into the marketplace, a second benefit has become apparent. Because PCs generally copy disks file by file, it just isn't possible to run off a second copy of a DMF disk for a "friend" as the copy process will simply come to halt with a "no space left" message.

Microsoft realised from the outset that a byproduct of DMF would be to reduce piracy, to some degree. Although it is not giving out any details, the general enthusiasm for the format within the organisation indicates that this sort of casual piracy of office-type software has all but been eliminated.

There were, it appears in the early days, plans to offer the format as a licensable product but those have been shelved. This is partly because it would only really be of interest to another huge software publisher (and IBM/Lotus are already using a variation on the theme), but mainly because of the anti-piracy benefit that using DMF has generated.

Microsoft has made DMF technology available to several disk-copy equipment manufacturers, so that they can actually get their own disks duplicated. But the format can also be included in smaller copiers for multi-site licensees. Although not large in number, they do exist, and some use a single physical software copy and then distribute their site copies on floppy disk. They can buy a disk duplicator and under strict licence from Microsoft have the DMF software included to produce their own 1.8Mb disks.

Tim Frost

Horizons
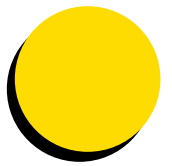
Adventures in Web-head heaven

Linux is undeniably popular. It's free, it's user-maintained and a growing number of Netters on a budget are using it to gain a low-cost presence on the Internet.

BUDGET-CONSCIOUS WEB-heads, eager to begin putting content on to the Net but without the wherewithal to buy a professional Unix system, are turning to Linux in droves.

As you might gather from the name, Linux is a Unix variant, currently running on Intel-based PCs and soon, PowerMacs. It's somewhat like a plug-compatible Cyrix 586. To the applications that run on it, it behaves exactly like Unix, yet there isn't a single line of original Unix code in the Linux kernel. Linux, which began life as a school project, is a fast, 32-bit, truly multitasking, multi-user, memory-protected operating system, just like Unix. Best of all, it's free.

As you might expect, it's this free-ness that makes Linux attractive to the lower-budget Web operation. But the joyous thing about Unix (and plug-compatible Unix clones such as Linux) is that the whole concept of "free" goes further than it does anywhere elsewhere in the software industry.

People write things for Unix, then give them away for one of two reasons. They could be doing it as an academic project, as happens with all the fine Web software developed at US universities such as Carnegie Mellon, or research bodies such as the National Center for Supercomputing Applications (NCSA). Or it could be that

Linux Journal: the gear-head's bible

they're just old-school hackers who believe software should be free to whoever wants to use it. This attitude finds its highest expression in organisations such as the Free Software Foundation. The result is that Unix offers some remarkably good software (Web servers, word processors, C++ compilers) freely down-loadable, that would command a considerable premium on any other platform. It's a salutary lesson if you're used to seeing Windows utilities such as a desktop clock command a $25 shareware fee and delete themselves if they're not paid for. The great benefit of Linux is that it lets Web providers access great, free, software such as servers, CGIs, perl-scripts and file transfer daemons, without having to fork out for an expensive, specialised, Unix box.

One of the joys of Linux is that it can take a machine defeated by Microsoft's OS, such as a 386, and make it a fairly snappy computer — rather like monkey-gland treatment.

Linux isn't binary compatible with Unix: it has its own libraries to handle the peculiarities of

being on an Intel system. If you want to port an application from another version of Unix, you need to recompile the source-code. However, this is common practice in the Unix world — compatibility is not a strong point among the many flavours of Unix: the Free Software Foundation's GNU compilers are available on the platform and come as recommended parts of the installation process. Just type "make program name" and you're off.

This leads on to another reason why Linux is popular. Not only is it cheap and runs on PCs, which cost a fraction of the price of an equivalent Sun SPARCstation, but it's endlessly customisable. The source code for the various Linux kernels is available and

included on most installer CD-ROMs. There is a certain machismo attached to working through the source code, commenting out the parts you don't need. But the advantage of this otherwise hyper-nerd behaviour is that you can optimise Linux to run on your system.

Another manifestation of this tendency is the fact that Linux is maintained by a network of volunteers around the world, who take it upon themselves to update the kernels, write device drivers and add system utilities such as shells. There's little co-ordination, so the devices and types of PC supported (although extensive) do have sporadic gaps. But the ultimate in Linux machismo is to write your own device driver.

The fatal attraction that Linux has for the Unix gear-head cancels out the main problem with the OS. Because it's free, not manufactured by a slick Californian company and comes either direct from the Internet or from shareware libraries or bookshops (many popular distributions come with How-To manuals), there is no official support. If your SPARCstation goes down and no amount of poking around in the entrails of the core dump explains the problem, you can call Sun and a besuited minion will be despatched to fix it.

Linux has no aftersales support to speak of: if it goes wrong, which it does a fair bit, it's down to your skills and those of the hundreds of thousands of users around the world on the various Internet newsgroups to solve it — and there surely isn't a single Linux user who's not Internet connected. But if you're enough of a gear-head, it's a challenge you'll relish.

Jim Smith

PCW Contacts

Jim Smith is development manager of **Wide Area Communications**, a full-service Web consultancy which uses Linux for development but trusts Solaris to deliver the pages to a waiting public.
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CUTTING EDGE

Bluesky

Calling all **agents**

Software agents may be the beginning of true artificial intelligence. And they're coming to a desktop near you, soon.

It is ten years since Marvin Minsky, founder of MIT's Artificial Intelligence Laboratory, proposed in his groundbreaking book, *The Society of Mind,* that intelligence can emerge out of non-intelligence.

In Minsky's view, the human mind is made of up of many processes he calls "agents", each of which performs a single very simple task requiring no innate intelligence whatsoever. But connect enough of these agents together "in certain, very special ways", and true intelligence emerges. These agents of the mind are the inspiration for a new kind of software design which may hold the key to the future of computing.

Software agents will be goal-directed, may operate autonomously, will learn from their previous experiences, be reactive to their execution environments, and collaborate with other agents. The claim is that recognisably "intelligent" behaviour will emerge.

Suppose you decide to buy a new colour printer. You summon a suitable software agent and tell it to: "Find the fastest colour printer under £400, with the best warranty and upgrade deal, and the best reviews." Off goes your agent, marshalling the appropriate Internet search agents to scan online dealers' catalogues, discussions in appropriate newsgroups, and relevant Web sites. The agent will eventually report back to you a summary of its findings. You scan the list, click "yes" against your choice, and off goes another agent, ordering the item with your credit card and telling your "personal finance" agent that you've made a transaction.

It sounds far-fetched, but prototypes of such agents already exist. Andersen Consulting's "BargainFinder", for example, allows comparison shopping for CDs. You supply the title of the CD, and Bargain-Finder visits nine retailers on the Web on your behalf, returning a summary of prices and delivery charges.

The current buzz is to call such agents "intelligent". Intelligence is a loaded term: one person's intelligent agent is another's humdrum software tool. Nevertheless, agents are now a hot topic of research in the Computer Science and Artificial Intelligence communities, and intelligent or not, it is certain that agents of one kind or another are set to play a prominent role in information retrieval and filtering.

Traditionally, information databases have been the domain of computing professionals, but in the last couple of years, anyone with a modem has had access to the largest worldwide distributed database of all time — the Web. The problem of making sense of the unimaginable amount of information out there is a hard one. Current strategies for indexing the Web are somewhat naive, and rely on software robots crawling around the world, accumulating and indexing information as they go. The resulting databases are huge. Lycos, for example, currently claims to store 32Gb of indexed Web data. Such databases are monolothic, and will not scale well as the size of the Web increases. In the future, we should expect to see a proliferation of agents compiling smaller, specialised and inter-connected databases.

At the moment, when seekers of information perform keyword-based searches on Web databases, these are generally one-off operations. An agent, however, may use its experience of previous searches and work in collaboration with other agents. The University of Massachusetts' "searchbots" are a step in this direction. They offer goal-directed searching with multiple agents performing parallel searches using standard Web tools, filtering the results appropriately.

A similar agent, currently in Beta testing, is IBM's "infoSage". You submit an "interest profile", and infoSage filters news and information sources on the Web, emailing you twice a day with a "personalised newsletter" of snippets relevant to your interests. As with many such systems, it would be inappropriate to call infoSage "intelligent", since its filtering algorithms are somewhat inscrutable: some users report receiving articles which appear to have nothing whatsoever to do with their interest profiles. And one can't help wondering just what IBM is doing with all those profiles it collects.

Although the ideas in agent research are exciting, some people find agents decidedly unattractive. They worry that they take on too much responsibility, leaving their users confused about what is being undertaken on their behalf and leading to alienation.

There is also a view that the claims for intelligent agents will lead to unfulfilled expectations, rather like the failure of Artificial Intelligence research to live up to its promises in the seventies. Surprisingly, one of the fiercest critics of agents is Jaron Lanier, a pioneer of virtual reality.

Intelligent agents are not yet here, but the chances are that they will arrive soon. And, as long as we can trust them, we shall one day wonder how we ever managed without them.

Toby Howard

CUTTING EDGE

R e t r o

Nippon to the bandwagon

Nippon Steel's Librex notebook was a vain attempt to join a growth market. It was over-hyped, over-priced and over here. But not for long…

Sometimes being a computer journalist gives you an interesting perspective on the market: the better the lunch, the poorer the product.

When you've seen the same graphs from half a dozen companies, each predicting that they will be the third biggest manufacturer in a field with a 30 percent market share, you have a feeling that someone is headed for a fall. It's likely to be the company with the biggest restaurant bill.

It was against this background, at Le Gavroche restaurant, that Librex announced its intention to be the third biggest notebook manufacturer (behind Compaq and Toshiba).

The Nippon Steel Corporation is the 28th largest company in the world, and like all really large companies it has interests outside steel. This included a large data processing department which came up with the idea for an own-brand computer.

The Librex notebook was the company's only product,

The Nippon Steel Librex 386SX — the hype wouldn't wash

available in 286 and 386 guises, each with a choice of hard disks. The corporate rationale behind this was that as the notebook was the fastest area of growth in microcomputing, the company could capitalise on this.

At the time, back in July 1991, *PCW* noted the folly: "There must be around 30 computer companies which want to have a 20 percent share of the notebook market by 1992. Now at least 25 are going to be disappointed, and it is more likely that all 30 will feel hard done by." Indeed, the press conference majored on this

theme — well, that and the nature of the advertising campaign. Its images of freedom were more akin to tampons than terminals.

The major problem for the Librex was that although Nippon Steel considered itself to be big and important, no-one else did. So with a Librex costing £3,000 and a Viglen costing £1,700, it had to rely on those cheesy advertisements to attract its customers.

For the target market of business people, who spend more time in first class airline seats than they do at home, support and reputation (even if it is only a reputation built upon advertising) is more important than the specification. Which was just as well. Back then, we said the Librex was "very dull". The machine we reviewed (in our September 1991 issue) had the standard and unexpandable 4Mb RAM, a 40Mb hard disk, 20MHz 80386SX and an Award BIOS. And, of course, a monochrome screen.
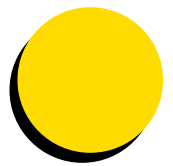
The power-saving features did not extend to a sleep mode which triggers when you shut the lid, but did include the options one would expect for screen and hard-disk timeouts after a set period of inactivity. The keyboard was okay but nothing to write home about, with reduced key travel to restrict the height of the machine.

There were some strange aspects to the design: the battery was connected with a socketed lead (although this was changed on later models), and a software-operated power switch.

By dropping the clock speed to 10MHz you could get a good couple of hours' continuous use — less than Nippon Steel's quoted three hours. But at the time of review, it wasn't the staying power of the Librex we were worried about; it was the staying power of the manufacturer, and our fears were borne out. It didn't take much time using the machine to form this opinion; just the rather good lamb chops and the graphs.

The moral is: if you are going to launch a so-so computer, you need to get the price right. And if that means no graphs and a round of Big Macs, so be it.

Simon Rockman

BOOKS

A Java sourcebook is strictly for the evangelists, non net-heads might browse through a basic multimedia overview and venture into the realms of cultural philosophy, and there's good news for those who want to protect data on the net.

Multimedia: The Complete Guide

This lavishly-illustrated book comes from information specialist and one-time outpost of the Microsoft empire, Dorling Kindersley. Since parting from Bill and his chums, DK has continued to push into multimedia publishing, so it comes as no surprise that the company should launch this title. Every single page is served by beautifully-printed colour illustrations and, like most DK books, you cannot help picking it up and flicking through it.

Of course, it's an anachronism to use an "old-fashioned" book to teach people all about multimedia. But DK's now classic style provides one of the best introductions to the world of computing and multimedia. And anyway, books share many of the attractions of multimedia. You can flick from page to page using an index to search, and the pictures don't take an age to download.

The title is rather misleading. The book isn't just about lots of CD-ROMs and computer animation (although these obviously form chapters): it also serves as an introduction to PCs and how they work, the Internet and not-so distant developments such as intelligent homes and personalised newspapers.
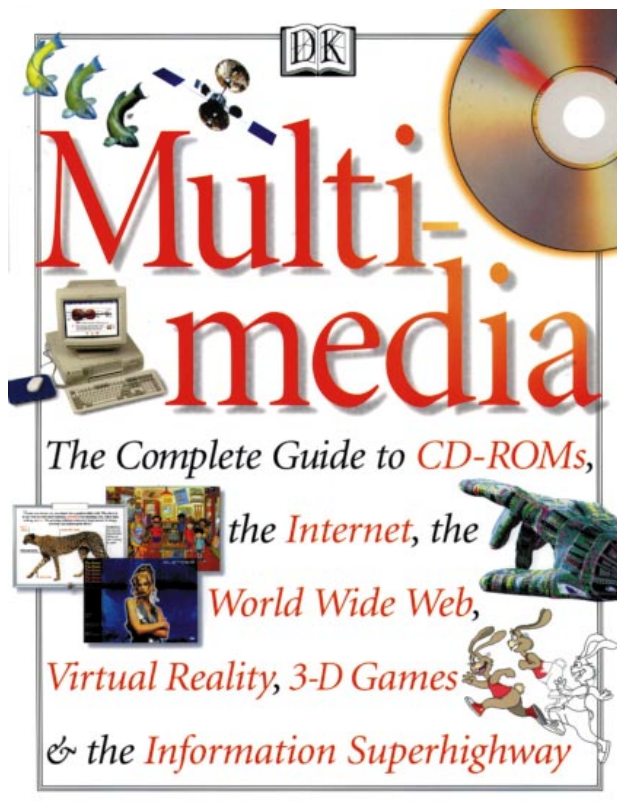
This book has everything: how sound works, the difference between twisted pair cables and coaxial, and how to design type to be read on-screen. The chapters on leading games consoles make for an interesting read and are as up-to-date as is possible.

Buy it now rather than later, because in two years' time it will be out of date. For anyone wishing to know more about the information technology affecting our lives, this is a highly recommended choice. Some more eclectic titles are so in love with the technology that they miss the point, and this very solid read manages to avoid this trap.

PJ Fisher

Multimedia: The Complete Guide
Editors Joe Elliot, Tim Worsley et al
Publisher Dorling Kindersley
Price £19.99
ISBN 0-7513-0243-0
Rating: ✍ ✍ ✍ ✍ ✍

Bandits On The Information Superhighway

This overtly friendly title aims to reassure and advise those who worry more about what will happen when they go on the net than about getting connected in the first place. It's not just businesses that are worried by the net. Women are worried by sexual harassment, and parents are worried that their children might see things they shouldn't — and that doesn't just mean porn.

What this book aims to do is separate the hype surrounding the perils of the Internet from the reality. As it succinctly states: "The Internet mirrors our society." That's a point worth repeating: just as suburban trains are used overwhelmingly by law-abiding citizens, there are unfortunately a few who can make the journey hell. But the trains are not to blame.

As far as business is concerned, *Bandits* is aimed mainly at the consumer. It looks at ways to avoid getting one's fingers burned buying on the net, warning you to avoid the get-rich-quick schemes which have started to appear in newsgroups over the last year or so. Most of the advice is straight-forward and it really comes down to applying the same principles you would when buying goods elsewhere.

It also looks at email, blowing apart the myth that it is private when in truth it can be read at more than seven different points along its journey, due to the way the Internet sends packets of information. It also warns of the danger of spoof email, in which someone pretends to be you or puts a false header onto a message to give it credence. But it also tells how anyone, with a minimum of technical knowledge, can beat the hackers at their own game.

On the subject of porn, the book again takes a sensible stance, pointing out just how small newsgroups devoted to such activities really are. It claims only 290,000 users worldwide actually look at the infamous alt.binaries. pictures.erotica on a regular basis. That's still a small number compared to the total actually using the net. It makes no mention, however, of the growing number of pornographic web sites.

Whatever the truth, the book makes rational suggestions about how to protect children,

such as using blocking software and taking an interest in children's Internet activity.

The layout of the book makes it an easy read and serves as instant reference. Most pages feature anecdotal advice spots and instances of Internet banditry, some sinister, some more benign. This book also has enough in it to serve as a good general technical introduction to the Internet.

PJ Fisher

Bandits On The Information Superhighway
Author Daniel Joe Barrett
Publisher O'Reilly & Associates
Price £11
ISBN 1-56592-156-9
Rating: ✐ ✐ ✐ ◌ ◌

Java Sourcebook

Don't be misled by the attractive cover; this is still a pretty hardcore book for seasoned programmers. It starts off simply enough, with a brief description of how Java works and what it does. But you really need some programming experience to get the best out of it. The
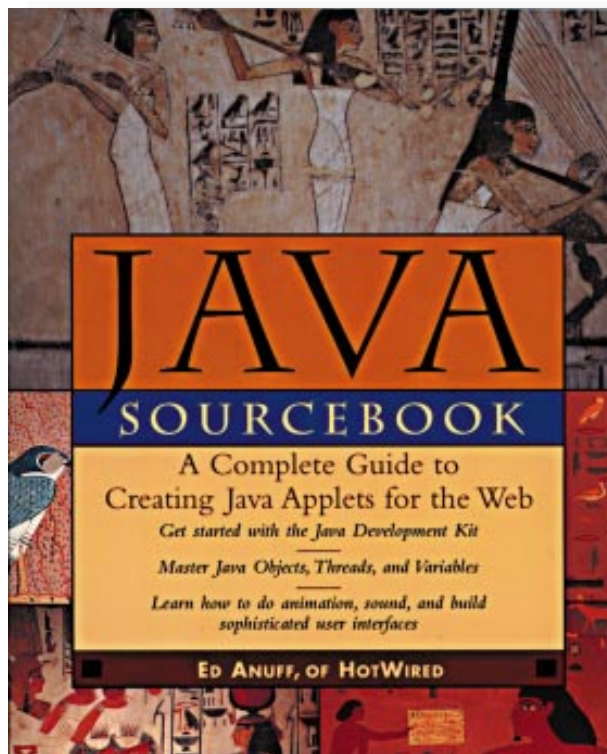
blurb on the back of the book promises that "No matter where you are in your level of programming, this book will turn you into a Java programmer, even if you've never done object-oriented programming before." Well, maybe. The bottom line is that Java just ain't easy and anyone hoping for an instant education is going to be disappointed.

You will also need the Java Development Kit (available from Sun's Java web site on www.java.sun.com) before you do anything. It would be nice if the publishers had included the JDK on a companion disk, but most would-be Java jockeys should have net access anyway.

Delving deeper into this book proves that thought has gone into its structure and you can learn a lot. It explains clearly what Java classes and sub-classes are, and the difference between classes for different platforms. After that you get into the hard stuff of actually building Java applets for the web. It takes you through projects such as building Applet user-interfaces with interactive buttons and pop-up menus.

This book and a copy of Sybase's new Optima++, which brings RAD techniques to Java, would make an excellent introduction to the subject. This is a lucid book that tries hard to make a complex new language easy to get to grips with. What it doesn't tell you is whether it is worth doing in the first place. If you're serious about Java, get yourself a copy and warm up your Web pages. Wiley has its own Java resources on www.wiley.com/compbooks/.
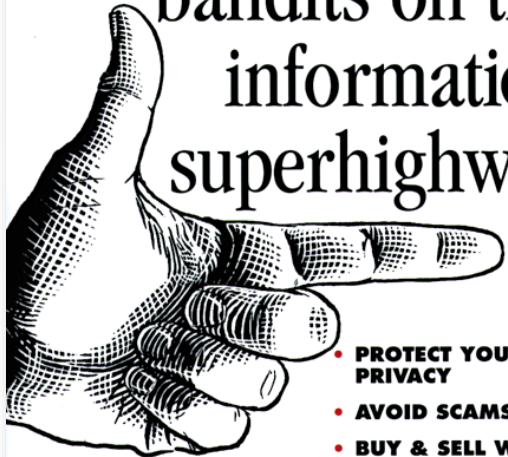
PJ Fisher

Java Sourcebook
Author Ed Anuff
Publisher John Wiley
Price £19.99
ISBN 0-471-14859-8
Rating ✐ ✐ ✐ ✐ ◌

Software for the Self — Culture and Technology

Technology has an immense effect on the arts. Television, once regarded as a source of mass entertainment, is now seen to be — at its best — an artform. Perceptions of what constitutes high art evolve as new technologies come along.
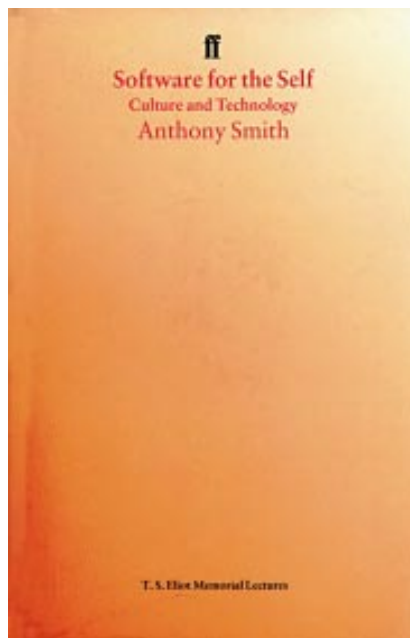
Software for the Self, based on a series of lectures by Anthony Smith, promises to evaluate how the digital revolution has changed the face of culture. It's a fascinating subject, but this book fails to do it justice.

Smith does a good job of demonstrating to the reader how far everyday life is permeated by the idea of an "information society". It suggests efficiency, easy access to knowledge and freedom from the grind of traditional "work". It's such an attractive metaphor that politicians use it to create a utopian vision of the future. US vice president Al Gore's now famous speech to a telecommunications conference used the notion of the "superhighway" to suggest that the Internet would streamline the quality of all of our lives. "We can now at last create a planetary information network that transmits messages and images with the speed of light from the largest city to the smallest village on every continent," he said. There are one or two pearls of wisdom: Smith suggests, for example, that the strength of the "information society" metaphor is due to the discovery of DNA and the idea of information as a blueprint for life.

On the whole, however, it's nothing we didn't know. Smith fails to inject any fresh insights into familiar debates, preferring to re-hash tired sociology. The first two chapters of the book examine how notions of "art" have evolved from the ancient world to the present day, and later ones set modern technology firmly in this context. It's all written in a wordy, lit-crit prose style, which tends to turn promising subject matter into a dry lecture. For example (on cyberspace): "We are evolving a medium of contrived irrationalism, in which the culture of pure argument dating back to the enlightenment dissolves into a complexity of interactive improvisations." Come again?

Smith's focus on the Internet is a journey through well-mapped territory: Is it the superhighway of freedom or a Frankenstein's monster? Should there be censorship? Is it anything more than a CB radio forum? After such a detailed history of modern culture, the reader expects an authoritative answer to many of these questions, but it's not forthcoming. One is left with the overall question, "So what?".

Jessica Hodgson

**Software for the Self —
Culture and Technology**
Author Anthony Smith
Publisher Faber & Faber
Price £7.99
ISBN 0-571-17768-9
Rating ✐ ✐ ✐ ✐ ✐

Top Ten Books: June 1996

1	Java in a Nutshell: Desktop Quick Reference	O'Reilly	£10.95
2	Teach Yourself Java in 21 Days (Book/CD-ROM)	Sams.net	£37.50
3	Programming Windows 95 (Book/CD-ROM)	Microsoft Press	£46.99
4	Hooked on Java	Addison-Wesley	£24.95
5	Microsoft Windows 95 Resource Kit (Book/CD-ROM)	Microsoft Press	£46.99
6	Teach Yourself Web Publishing with HTM L 3.0 in a Week, 2nd Ed.	Sams.net	£26.95
7	Inside Visual C++, 3rd Edition (Book/CD-ROM)	Microsoft Press	£41.99
8	Teach Yourself CGI Programming with Perl in a Week (Book/CD)	Sams.net	£37.50
9	Windows 95 Secrets (Book/CD-ROM)	IDG	£38.99
10	Introducing Microsoft Exchange (Book/CD-ROM)	Microsoft Press	£27.99

List supplied by The PC Bookshop, 11 & 12 Sicilian Avenue, London WC1A 2HQ
Tel: 0171 831 0022. Fax: 0171 831 0443

CUTTING EDGE

CUTTING EDGE

CD-ROMs

Probably the best interactive music CD in the world, a history of medicine which makes ER look like Neighbours, a stroll through some of the world's greatest art galleries, and 1000 culinary delights.

Sting: All This Time (for Windows 95)

The entertainment industry is changing fast, and musicians can no longer rely on albums alone to reach all of today's audiences. This has become more apparent in recent months, following interactive multimedia releases from Peter Gabriel and the artiste formerly known as Prince. All This Time is the most recent, and most promising, interactive music CD so far, offering a fascinating insight into the life and music of the artist currently known as Sting.

All This Time is set in a part gothic, part medieval 360-degree landscape, where enchanted castles skirt Scottish coastlines. You move around by dragging your mouse to the edges of the screen. When you click on a "hot" object, such as a castle door, you are whisked off to a new location where discovering what to do next is all part of the fun. Clicking on a headstone in the Mexican crypt, for instance, brings Sting and his accompanist up from the dead to play an acoustic version of the Venezuelan Waltz. At this point he talks about the death of his parents and how it affected his music.

A medieval backdrop provides the setting for an exploration of Sting's work. The "virtual cinema" shows highlights from his film and TV career and his singalong

Not all is dark and mysterious, though: there are moments of humour. Down in the local while enjoying a few pints, Sting invites you to view some of his television appearances. These include the hilarious interview with Vic and Bob on Saturday Night Live and his charity singalong with the Simpsons.

At this point I should perhaps mention that there are 15 new live acoustic performances on this CD, including Sting's most famous of all — "Message in a bottle". You'll have to find where he's "hanging out" first, though, in order to see them. On your travels you will come across hidden Tarot cards from which
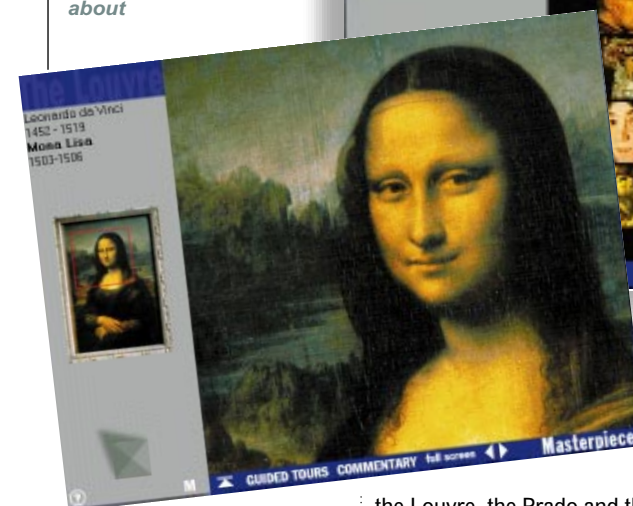
Sting will give you a personal reading — a quirky, interesting touch. Down in the "virtual cinema" you can view excerpts from his diverse film career. He also talks about his experiences in the film industry.

All This Time is an excellent example of what mulitmedia should be about. Sting fans the world over will love it, although there's little to interest a more general audience.

Steven Helstrip

Sting — All This Time
Contact Philips Media
0171 911 3000
Price £39.99
Rating ●●●●●

Sting and friends having a bit of a jam in the front room. It's not all gothic castles and crypts...

Something to smile about

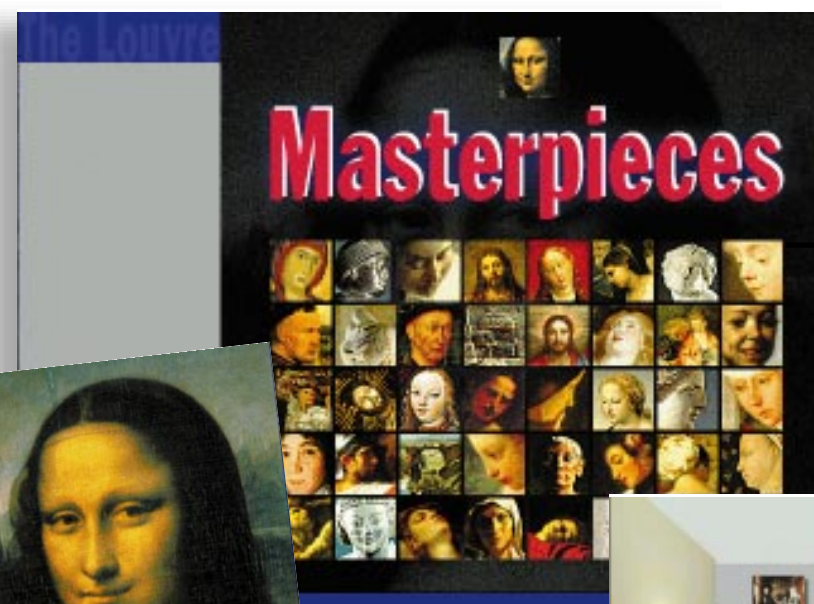*Stroll through the world's greatest museums, room by room*

The Great Museums of Europe/The Louvre

The art galleries of the world are well represented on CD-ROM. The National Gallery and the Louvre have been the subject of at least two other CDs apiece from various producers, and now EMME, well known for its glossy products on numerous artists, are jumping on the bandwagon.

Rather than suffering from a sense of *déjà-vu*, two series offer a new approach and a fresh look at the galleries. The Great Museums of Europe series is the more simplistic of the two. There are six museums on each disk, including the National Gallery, the Uffizi, the Tate, the Louvre, the Prado and the Vatican Museum. For each museum there is a short introduction giving details of opening times, locations and prices. Once inside, you can scroll through the different rooms and see the works displayed there.

The number of rooms in each museum varies from two at the Tate to twelve at the Uffizi. Most of the works include just the image itself. You can zoom in on some, but for commentary you need to turn to the Masterpieces

section. Here there are only a few works, but they do have some explanatory notes with them. Like the rest of the CD, it is a very superficial introduction. The series seems to be aimed at a secondary school user, rather than at an art expert. This is compensated somewhat by the excellent History section, which takes you through the main events surrounding the development of modern Europe and the influence this had on the art of the time.

The Louvre double CD is a more substantial package. There is more detail on the works, all of which can be viewed in detail with a zoom tool that pans around the painting, and the commentary itself is far more advanced than the Great Museums disks. The zoom facility alone, however, takes up lot of

room, hence the two volumes.

The package is clearly aimed, without being too precious, at a more discerning user. There are many of the same features as on the other CDs, but the whole ethos is pitched much higher. The result is a CD that is well worth having.

Adele Dyer

The Great Museums of Europe — EMME
Contact Koch 01420 541880
Price £39.99
Rating ●●●○○

The Louvre
Contact Koch 01420 541880
Price £39.99
Rating ●●●●○

CUTTING EDGE

Gory, ghoulish, but gripping, the History of Medicine contains a wealth of facts about how medicine has evolved, from the ancient world to the present day

History of Medicine

Britain's fascination with all things medical never ceases to amaze me. We lap up medical soaps and drool over real-life hospital documentaries.

This two-CD set takes very much the same approach — a morbid and slightly ghoulish fixation with disease and pain.

Everything is presented in documentary form, with narrated voiceovers and stunning graphic designs illustrating the various subjects. You can leave it to play and just sit back and relax. If, however, you want to navigate around, the disk is so well constructed that you wonder why all CD-ROM producers can't make life this easy.

The main part of the disk focuses on how medical practice has evolved to its present-day state. It starts way back in the prehistoric ages, when our ancestors were regularly scourged by anthrax, rabies, sleeping sickness and gangrene. This goes through to the present day and the spread of the Aids virus.

There is plenty of gory detail, and several interesting facts. The best examples of this are in the "Did You Know" section; random medical trivia on everything from a story about a man who died from drinking too much carrot juice, to the fact that Moses had a hare lip.

As a sideline various experts talk about their own particular line of interest, everything from quackery to anatomy to forensic medicine. Instead of the usual dithery videos of talking heads approach, Flagtower has opted to use a documentary style with the experts talking over a moving reel of images.

The overall feeling of the disk is a good one. It is very slickly put together and the content is excellent.

Adele Dyer

History of Medicine
Contact Flagtower 0500 486500
Price £39.99
Rating ●●●●○

little superfluous to some, but it is something which can only be demonstrated, not explained.

To the beginner, this CD is a good introduction to French cookery. But don't expect the look or the variety of the magazine.

Adele Dyer

Elle — 2000 Recipes
Contact New Media Solutions
0181 600 6000
Price £39.99
Rating ●●●○○

Elle — 2000 Recipes

The main attraction about *Elle* magazine has always been the way it looks — true to the ethos of a style magazine. In the old French version, the recipe cards were four to a page, so you could cut them out and slip them inside an ordinary paperback cookery book. Each one had a glossy photograph with ingredients on one side and instructions on the other.

In the British version, the pages are equally glamorous, so at first look this CD was a disappointment. These are the same people who produced the visually stunning "A Stroll Through Twentieth Century Art", and by comparison the interface to this disk is distinctly shabby.

The recipes are more Tante Marie than Marco Pierre White. Still, there is nothing wrong with traditional recipes, and the ones here all have their place in any cook's repertoire.

All the recipes come complete with a photo, tips and a wine suggestion. The content, therefore, is very much what it is in the magazine, but it just does

not look as good. To find the recipes, you can choose an ingredient and the amount of time you want to spend cooking it. This is a very good idea, but all too often you get the answer "no suggestion found". Infuriating, to say the least.

To add spice to the proceedings, there is a menu section where you can choose a variety of occasions. The CD makes suggestions on how to put together a balanced three-course meal. Most of these are a little dull, however, and very little imagination is shown in the combinations of dishes.

One of the best aspects of the disk is the "How To" video section. Some of these are a bit pointless for the experienced cook, but many are quite

interesting. Learning how to caramel a mould may seem a
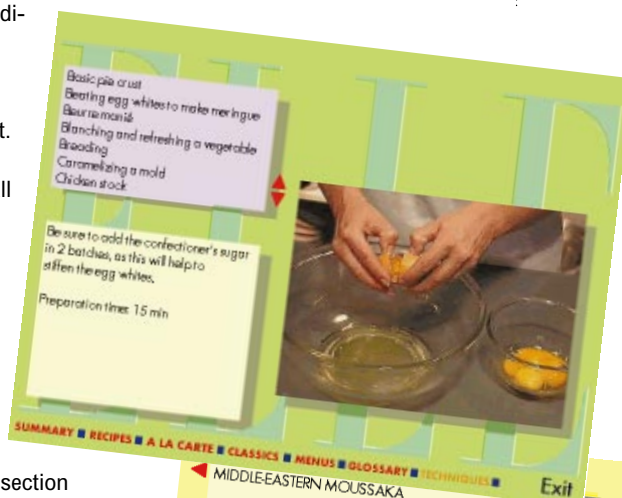
CUTTING EDGE
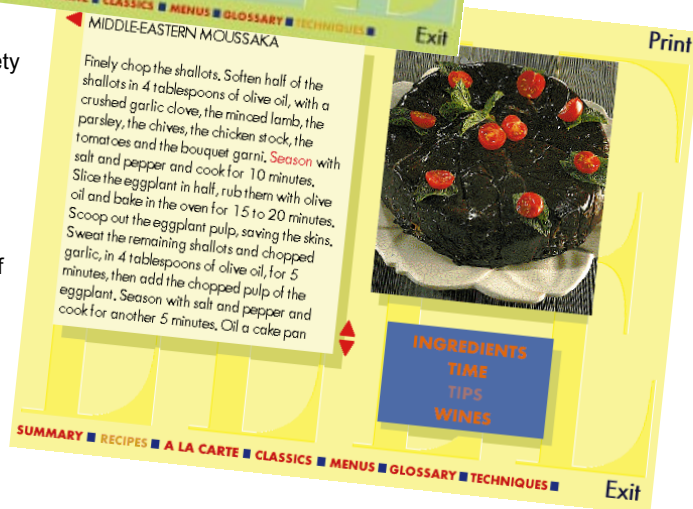
Screenplay

NEWS

Leading simulation specialist Maxis is set to break into unknown territory with its latest title, Mindwarp. Billed as an exciting action/strategy affair, it will apparently send players plummeting down the twisted 3D corridors of an alien dreamscape. You enter the landscape of the alien mind using a thought vehicle called a Synaptic Probe, pulsing with energy and alive with bio-psychic devices. The idea is to battle against computer or human-controlled opponents, using high levels of strategy. To make things more interesting, the alien landscape is a sentient, living organism that's constantly changing. The 3D graphics are rendered on the fly to provide a realistic effect.

It all sounds a far cry from the pace of SimCity, but Sim fans needn't worry. The company also has plans for SimCopter and SimGolf later in the year. **Maxis 0171 490 233**

MONSTER MASH

Continuing its push into the action market, 7th Level is set to release a new platform affair called Arcade America. You play Joey, a typical all-American boy, whose pet monsters have accidentally blown up the house while trying to wake him up. The explosion has sent them hurtling across the land, and now you have to round them up.

7th Level say parts of the game will include more than 10,000 cells of hand-drawn, digitally inked and painted animation, extraordinary sound effects and an authentic cinematic soundtrack. Sounds Good. Destined to be in the shops by the time you read this, Arcade America will run with both Windows 3.1 and 95. **7th Level 01932 355666**

Charts

1	Civilization 2 (CD)	Microprose
2	Duke Nukem 3D: Demo (CD)	US Gold
3	Command & Conquer: Covert Ops (CD)	Virgin
4	Command & Conquer (CD)	Virgin
5	Descent 2: Demo (CD)	US Gold
6	NBA Live 96 (CD)	EA
7	Sam & Max: White Label (CD)	Virgin
8	7th Guest: White Label (CD)	Virgin
9	FIFA 96 (CD)	EA
10	Worms (CD)	Ocean
11	Under a Killing Moon (CD)	Kixx
12	Day of the Tentacle: White Label (CD)	US Gold
13	Rebel Assault: White Label (CD)	EA
14	Beavis & Butthead (CD)	Viacom
15	Champ: Manager 2 CD	Domark
16	Screamer (CD)	Virgin
17	Rise of the Triad (CD)	Access
18	PGA European Tour (CD)	EA
19	Wing Commander 4 (CD)	EA
20	Spycraft (CD)	Activision

Strategy fans and gamers with an Internet connection can break into the world of espionage with SpyCraft: The Great Game. An interactive CD-ROM drama, SpyCraft has you tracking down clues to find the guilty party behind an international, world-threatening crime. The twist in the tale with this one is that you'll need to use the World Wide Web and Activision's home page to complete your mission.

SpyCraft has been designed with the new features of Netscape 2.0 in mind, and includes input from William Colby and Oleg Kalugin, former directors of the CIA and KGB respectively. Both will help you in your quest to stop the launch of nuclear missiles and avert a potentially nasty situation. Other plus points include encrypted codes to crack, voice analyses to perform and videos to help you in your hunt for the guilty. **More info on http://www.activision.com**

CUTTING EDGE

The Terminator:
Future Shock

At last, a challenger to the Doom throne.

Doom is without doubt the most influential game of the decade. Shortly after it hit the streets, we saw the release of Heretic, Descent, Rise of the Triads and a hundred other Doom-alikes. But none scored quite as highly when it came down to sheer playability. Until now.

Future Shock is the first game in a long time to really grab my attention and, indeed, much of my spare time. It's not just another 3D game with 17 deadly weapons and twice as many different monsties: there's a gripping story to go with it and plenty of variation. For those who didn't see the film, here's an abridged version of the future...

SkyNet, the US defence computer, becomes sentient and decides to take on the world with nuclear weapons. Not surprisingly, there are few survivors. Twenty years on, the battle still has not been won, and in this time SkyNet has developed intelligent robots to round up the remaining humans. By pure coincidence, you become part of a resistance movement and take on the responsibility of destroying SkyNet. It's not easy, though. There's no sign of Arnie, and the robots have much bigger guns than you.

The game starts on foot in downtown LA, where you first have to gather your weapons and track down a car to enable you to escape from the city. Once you meet up with resistance leaders, you face 19 missions which lead ultimately to SkyNet's demise, although I haven't got that far.

Your character and the vehicles you use are controlled using the mouse and keyboard simultaneously. The mouse determines which way you're looking and fires the weapons and grenades, while the keyboard allows you to walk, run, jump and select weapons. It doesn't take long to grasp and provides six directions for movement.

The combination of texture-mapped graphics, true 3D movement and a fantastic soundtrack really draw you into this game. Another plus is that no two places look the same since your missions have you in and about the sewers, in the city and searching wrecked buildings. You even get to fly a really cool hovercraft, once you've captured it, that is.

Steven Helstrip

System Requirements
486DX/50 with 8Mb RAM, DOS 5 (runs under Windows 95), 20Mb minimum disk space, double-speed CD-ROM and VGA display.
Price £44.99
Contact Virgin Interactive 0171 368 2255

PGA European Tour

The European edition of PGA's golf classic's got everything except the picnic hamper.

The latest addition to Electronic Arts' Sports series, PGA European Tour, is the follow-up to the best-selling PGA Tour Golf. It takes everything that made the original great, and brings it bang up to date with new graphics and sound.

European Tour lets you try your hand at three new courses: Wentworth, Kut Garden in Hamburg, and Ireland's K Club. You can play either as an amateur or as a professional, and the game adjusts itself to suit your skill. In amateur mode the computer selects the club for you and indicates the amount of swing needed to get the best results. This makes the whole thing easy to get into, although the settings

can be changed if you think you know better. In Professional mode you have to make all of the decisions yourself, but that's what playing for the big bucks is all about.

Before teeing off, you can take in an aerial fly-by movie of the hole from tee to green, with commentary from "the voice of golf" himself, Peter Alliss. This can be entertaining, but his hints on how to play each hole are equally useful. After this you appear on screen as a digitised photo-realistic golfer, complete with accompanying foliage and animated rippling rivers and ponds. The landscapes are particularly impressive, with first class 3D rendering. It's a far cry from the flatness of the original. Three

Real golfers being digitised

small windows or "PIPs" (Picture-in-picture) provide every possible view, to enhance the playing realism.

From here on the basic rules of golf apply, and the game carries on in the traditional "hit the ball along the fairway, onto the green and into the hole" fashion. Getting the feel for the club, which involves three mouse-clicks and a power meter, and adjusting to the game's response time takes a little practice, but that's the only way you can hope to get onto the Leaderboard. Teeing off certainly feels great with a generous swishing-club sound backed up by an appropriate comment from Mr Alliss.

The essence and skill of golf is difficult to capture, but PGA European Tour comes closer than any other. There's also a lasting challenge, with eight other European Pro players and a range of natural hazards to test your skill. The only things missing are the incidental bird noises and a picnic, for that total outdoor experience. Definitely the best golf game I have seen for the PC.

Nicola Kingsley

System requirements
486DX/66 or Pentium
MSDOS 6
Triple-speed CD-ROM
MSCDEX 2.21
16Mb RAM
VESA compatible with 512Kb Video RAM
Price £44.99
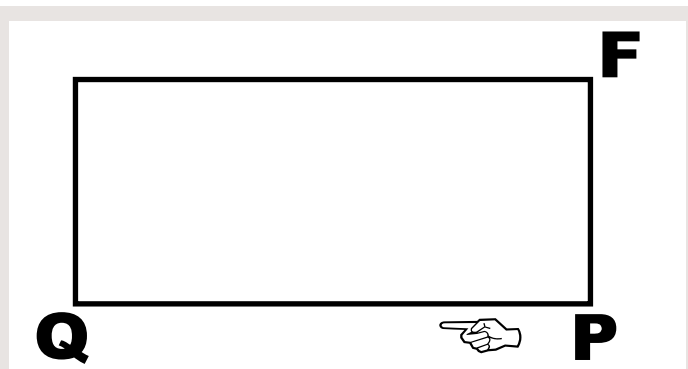**Contact** Electronic Arts
01753 549442

Leisure Lines

Brainteasers courtesy of JJ Clessa.

This Month's Quickie
I heard this one on the radio the other day and I thought it was worth including.
What did Tchaikowsky write between the years 1811 and 1813?

F

Q   ☞ **P**

This Month's Prize Puzzle
A very old chestnut this month, but perhaps some of you haven't encountered it before. It can be solved mathematically without a computer, but the calculations are quite difficult. However, it yields itself admirably to a computer simulation, and the equations needed for this are quite simple — just a knowledge of basic trigonometry, which should be well within the abilities of most of our readers.

A farmer is at the top right corner (F) of a rectangular field 200 yards by 100 yards, when he sees a pig (P) at the bottom right corner. He runs to try and catch the pig, always running directly towards it. The pig, meanwhile, runs in a straight line along the bottom edge of the field towards the corner (Q). If the farmer is initially 100 yards from the pig, and runs twice as fast, how far does the pig get before it is caught?

Now, that is the classic problem, but in addition I want you to tell me what speed, relative to the pig, does the farmer have to run at in order to be sure of catching the pig before it reaches the point (Q)? Your answer should be to the nearest 2 decimal places, please.

Answers on postcards or backs of sealed envelopes — no letters and no floppy disks — to: *PCW* Prize Puzzle - June 1996, PO Box 99, Harrogate, N. Yorks HG2 0XJ, to arrive no later than 20th June 1996. Good Luck!

Winner of March 1996 Prize Puzzle
A fair response, just less than 100 entries, to our number seed cycle problem — considering that the problem was one of greater than average difficulty.

The lucky entrant whose card came out of the bag first — using our random number generator — was Mr Simon Page of Whitstable, Kent, who gets our heartiest congratulations and, very shortly, his prize. The correct answers were:
• Longest Cycle is 110 iterations with a seed of 6239 and generates 97 numbers
• Shortest Cycle to generate 99 numbers is only 91 iterations with seed of 7277

Meanwhile, to all the nearly-wons, keep trying — it could be your turn next.

CUTTING EDGE

Win Typeshop Library

Font freaks, multimedia maniacs and DTP demons, have we got something for you!

I f your computing interests lie with DTP, presentations or multimedia, we've got a treat in store for you. Thanks to our friends at Fontware and Macromedia, this month we've got an absolutely fabulous selection of software prizes to give away.

Bitstream Typeshop CD-ROM Font Library

Founded in 1987 and based in Fareham, Hampshire, Fontware is a specialist reseller and developer of computerised typefaces.

For the person lucky enough to win, the company has kindly agreed to a give away a copy of its prized Bitstream TypeShop CD-ROM Font Library.

Font Fountain could be just your type!

The ideal desktop publisher's mate, Typeshop Library comprises no less that 1,085 professional fonts in PostScript format. Normally, each font must be purchased separately and unlocked with a special code before use, but Fontware has agreed to supply one *PCW* reader with a completely unlocked edition, with a retail value of over £900. To complete the package, Adobe Type Manager will be included so that the fonts can be used in all your Windows applications.
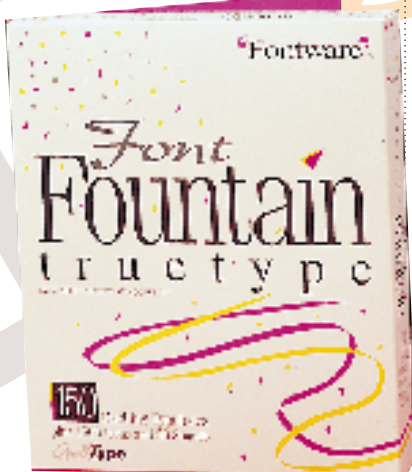
Fontware has also donated copies of its Fontware Font Fountain packs, containing 150 TrueType fonts, 1,500 icons and 50 sounds, for ten runners-up. A further 20 lucky readers will receive a copy of the company's Type Solution Guide.

For a chance to win one of these prizes, just answer **Question (1)**, below.
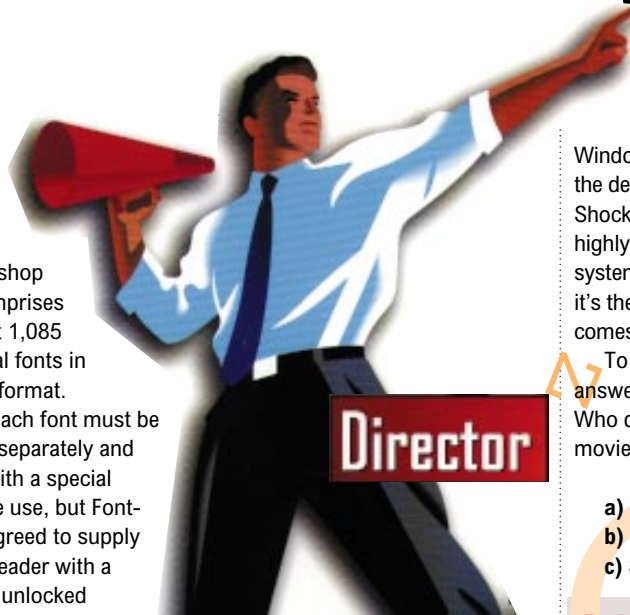
(1) What font is this:

"Font Competition"

a) Times
b) Courier
c) Helvetica

Macromedia Director

As if that wasn't enough, we've also got two copies of the brand new Macromedia Director 5.0 for Windows to give away. The premier multimedia authoring tool for the PC, Director is responsible for some of the best CD-ROM titles on the market, including the award-winning children's titles from Broderbund and games like Iron Helix. It's also the most popular application for cross-platform work — versions are available for Mac and PowerMac as well as Windows 3.1 and Windows 95.

Version 5.0 boasts a horde of improvements, including a new open architecture, 50 percent faster Lingo execution, compatibility with Adobe Photoshop plug-ins, and full 32-bit code for Windows 95 compliance. It's also the development environment for ShockWave, Macromedia's highly-acclaimed presentation system for the Internet. In short, it's the bee's knees when it comes to multimedia.

To enter our prize draw, just answer **Question (2)**, below. Who directed the blockbuster movie Jurassic Park? Was it:

a) Steven Segal
b) Steven Helstrip
c) Steven Spielberg

Rules of entry

This competition is open to all readers of *Personal Computer World*, except for employees, and their families, of VNU Business Publications, Fontware and Macromedia. Entries must arrive by 6th June 1996. The Editor of *PCW* is the sole judge of the competition and his decision is final. No cash alternative is available in lieu of prizes.

How to enter

To enter the competition, just write your answers on a postcard, or the back of a sealed envelope, along with your name, address and daytime telephone number, and send to: June Competition, Personal Computer World Editorial, VNU Business Publications, VNU House, 32-34 Broadwick Street, London W1A 2HG.

Hands On Contents

Hands On is the place where readers can contribute to *PCW*, and as always we'll pay for anything we use. Macros, sections of code and hints and tips will be rewarded with a £20 book or record token (please say which you'd prefer) and we'll pay hard cash for longer, more involved pieces. Please include relevant screenshots in .GIF format.

All submissions should be emailed to the author of the appropriate section or snailmailed to Hands On, *Personal Computer World* Editorial, VNU House, 32-34 Broadwick Street, London W1A 2HG. Questions and short hints and tips can be faxed on 0171 316 9313.

We're constantly working to improve the contents of *Hands On*. If you have any suggestions, send them to the Editor at the address above, or email them to: editor@pcw.ccmail.compuserve.com

Words of **warning**

Is there anybody there? Messages from beyond, an unhelpful ABC, and rides with the unknown driver all conspire to confuse a curious Tim Nott.

I've used Word for Windows since version one, and a noticeable change is the steady increase in the file size over the years; not only of the program but of its documents, too. When I upgraded from version 2.0 to 6.0, the Hands On Windows column upgraded itself from 17Kb to 24Kb, although the number of words remained the same.

Although versions six and seven ostensibly have the same file format, the latter adds a further 2Kb to the file. Curious to know what, exactly, added value was in those extra kilobytes, I opened a Word 7 file in Notepad. As expected, there was a load of binary header information, followed by the text itself, followed by more gobbledygook, followed by some more text on the subject of modem initialisation strings, which I didn't remember writing and which certainly wasn't visible when loaded into Word.

Perhaps, I thought, I'd been messing around with "hidden" text or something. Or perhaps I'd had a crash and the file had somehow got corrupted. But opening a few more files in Notepad revealed more "mes-

sages from beyond", most of which (but not all) I was able to track down to my offline mail reader. Curiouser and curiouser: was there something seriously wrong with my hard disk? Scandisk didn't seem to think so.

All became clear when Microsoft announced the "Service Pack 1", a minor update to Windows 95. This is mainly concerned with network and printing (and indeed, networked printing) issues, so I hadn't got round to downloading the

1.25Mb file. However, the readme file contains the following little gem.

"The Windows 95 OLE 32 update addresses file-management behaviour in Microsoft Word, Microsoft Excel, and Microsoft PowerPoint® for Windows 95. Because of the way these applications use OLE for file storage, files created by these applications might contain extraneous data from previously deleted files. This data is not visible while you use the applications. However, when such a document file is viewed by using Windows Notepad (for example), it might be possible to see pieces of information from the previously deleted files."

In case you didn't know, when you delete a file from disk by using the DOS delete command or emptying the recycle bin, you don't actually delete the data at that time. Instead, you mark that area of the disk as unoccupied so subsequent data can overwrite the "deleted" file. What these Microsoft applications are doing is grabbing a section of disk space without cleaning the previous data from it, which may then be preserved in the new file. Obviously, files you regularly delete (in my case, email and conference messages) stand a good chance of turning up again.

The Readme continues: "This could

Get a Liff

In last September's column (written when Windows 95 was still in beta) I shared with you the secret of how to customise the "Tips of the Day". To recap: run Regedit (having first backed up your System.dat and User.dat) and go to HKEY_LOCAL_MACHINE/SOFTWARE/Microsoft/CurrentVersion/Windows/Explorer/Tips. Alternatively (or if for some reason it's elsewhere), run Edit/Find... on "Tips" and keep hitting F3 until you see a list of the tips in the right-hand pane. Double-click on the number next to each message and you'll get a dialogue box where you can edit the "Value data" — in this case the tip.

Reader Peter Bryant has taken this not just a step but a whole new dimension further. He has created a .REG file containing entries from Douglas Adams and John Lloyd's book, *The Meaning of Liff*. For those of you who never visit bookshops or other people's lavatories, this is a list of strange-sounding but real place-names with implausible definitions. Example: "Stoke Poges (n) — The tapping movements of an index finger on glass made by a person

futilely attempting to communicate with either a tropical fish or a post office clerk."
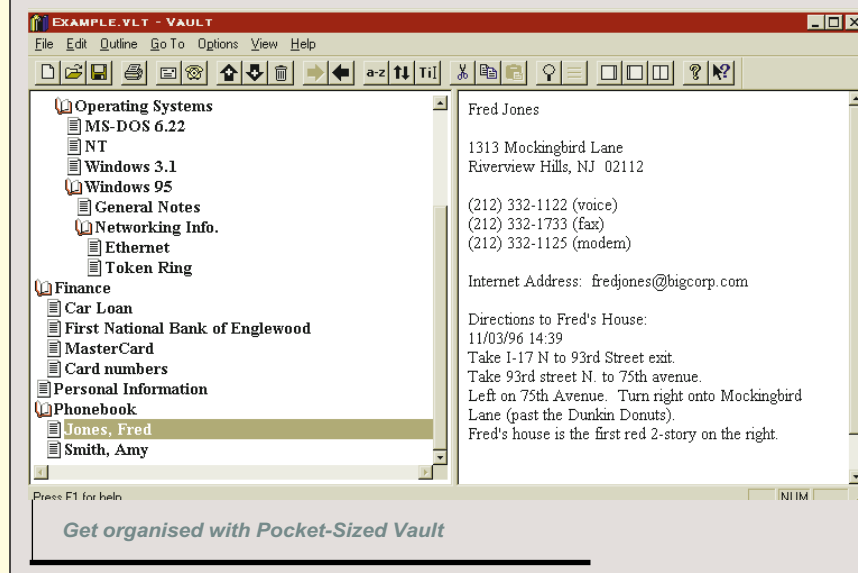
Though I would dearly love to share this with you in its entirety, there are a few small problems. Firstly, Peter's .REG file runs to 80Kb — when I double-clicked on it to add it to the Registry (yes, damn right I backed up first!) Windows complained it was unable to import the file. In fact, it had imported most of it but there is, according to my usual reliable sources, a 64Kb limit to a registry key. Secondly, the "tip of the day" selection mechanism seems to be capable of handling only 53 entries; the rest get ignored. Thirdly, there is the rather awkward but interesting concept of copyright. Nevertheless, many marks for effort, Peter. ● *Perhaps other readers would like to share their own favourite tips of the day? I'll include the funniest printable ones in a future column.*

Welcome

Welcome to **Windows** 95

Did you know...

Bishop's Caundle (n): An opening gambit before a game of chess whereby the missing pieces are replaced by small ornaments from the mantelpiece.

Windows Tour
What's New
Online Registration
Product Catalog
Next Tip
Close

☐ Show this Welcome Screen next time you start Windows

One reader's way of brightening his day

Is that a Vault in your pocket or are you just organised to see me?

Despite not being able to include "Liff" (see adjacent panel, "Get a Liff") on this month's cover-mounted CD-ROM, I'm not going to leave you empty-handed. If you've ever used a decent word processor, you'll know what an outliner is. If you haven't, it's a device to help you order your thoughts into a hierarchy of headings, sub-headings and body text. You can then expand or collapse a branch, or the whole outline, rather like an Explorer tree.

Pocket-Sized Software has produced Vault, a Windows 95 (and NT) outliner. There are two panes, with the outline "tree" on the left and the text for the highlighted item on the right. If a branch of the tree has sub-headings, then it appears as a book — bottom levels appear as a sheet. It has all sorts of clever touches for adding and rearranging items, and has a hook into the Windows phone dialler. The sample file doesn't really do it justice as there all sorts of things you could do here to create to-do lists, address books and so on. The real attraction is that you can mix and match all kinds of information. It doesn't, alas, support OLE so you can't include spreadsheet tables or pictures, but apart from that is an excellent little application. It's shareware, registration is $15 from Pocket-Sized Software in the US (see our contacts panel, page 268). I don't have an email, FTP or Web address but it's on this month's CD-ROM as Vlt32.zip.

EXAMPLE.VLT - VAULT
File Edit Outline Go To Options View Help

Operating Systems
  MS-DOS 6.22
  NT
  Windows 3.1
  Windows 95
    General Notes
    Networking Info.
      Ethernet
      Token Ring
Finance
  Car Loan
  First National Bank of Englewood
  MasterCard
  Card numbers
Personal Information
Phonebook
  Jones, Fred
  Smith, Amy

Fred Jones

1313 Mockingbird Lane
Riverview Hills, NJ 02112

(212) 332-1122 (voice)
(212) 332-1733 (fax)
(212) 332-1125 (modem)

Internet Address: fredjones@bigcorp.com

Directions to Fred's House:
11/03/96 14:39
Take I-17 N to 93rd Street exit.
Take 93rd street N. to 75th avenue.
Left on 75th Avenue. Turn right onto Mockingbird
Lane (past the Dunkin Donuts).
Fred's house is the first red 2-story on the right.

Press F1 for help   NUM

Get organised with Pocket-Sized Vault

pose information security or privacy concerns if you distribute electronic versions of files created using these applications." They aren't kidding. Have you just had second thoughts and deleted that angry resignation letter you wrote, but never sent, to your boss, calling him/her every name under the sun? It could survive and turn up in the most unexpected places, such as your Excel departmental budget projections. Likewise, your deleted (or so you thought) list of dodgy Web sites, the novel you've been writing in the firm's time and any other dark secrets you might be harbouring. Or, if you're emailing files as binary attachments, you could be freely distributing your company's deepest secrets.

At the time of writing, the Service Pack was available free from Microsoft's Web site (www.microsoft.com/windows) but by the time you read this it should be available on disk from Microsoft UK. This doesn't happen under Windows NT but can happen under 3.1 — you need to

contact Microsoft to get the "c" releases of Word 6.0, Excel 5.0 or PowerPoint 4.0 if you don't already have them.

Capital offence

Long filenames — don't you just love them? My particular *bête noire* is the way Word 7 defaults to giving a file the name of the first line in the template. So, every month, I start this column anew from a template that begins "Hands on Windows 95 column for PCW".

I type in the month, and save. It doesn't make any difference whether I add the month at the beginning or the end of the line, the document name is kindly filled in for me with the plain, undated "Hands on Windows 95 column for PCW". I've also found that long filenames have another practical limitation: if you name a file "Letter to Aunt Edith dated April 1996 thanking her for the very nice socks.DOC", you need a lot of screen real estate to see the title in list or details view — though it's rather clever the way in

Cunning curves and clever tricks

● Returning to those "Tips of the Day" for a moment (see "Get a Liff"), if you unticked the "Show this Welcome Screen next time you start Windows" in a moment of exasperation, and now have a nostalgic urge to see those tips again, you can get at them from the Help command on the start menu: double-click on the "Tips & Tricks" book icon, then "Tips of the Day", then "Viewing the Welcome screen". A new "Windows Help" window opens: on this, is a button marked "Click to open the Welcome screen" — which it does.

● In the March issue column, I mentioned that you can no longer perform the equivalent of the old "mystery INI file" trick with the registry. With Windows 3.1, any mysterious .INI file cluttering up your Windows directory could be moved to a safe place off the path and if nothing complained, or it wasn't recreated, then it probably belonged to an application that was no longer installed and thus could be safely deleted.

If you read last June's *Hands On Windows* column, the name Jason Ozin may ring a bell. He is the creator of that essential Windows 3.1 utility Inst-All, which records changes made to the Windows and System directories, and WIN and System.ini, when you install software.

This time, he points out that I'm wrong. Faced with a mysterious branch in the registry, "you can use the 'Export Registry File…' option on the 'Registry' Menu of RegEdit and then select 'Selected Branch'. By default, this will save the selected branch (prior to you deleting it) as an REG extension which can be double clicked to add it once again to the registry at a later stage."

● If you somehow managed to avoid March '96 and last September's columns you might not be aware that the "Send To" folder is one of the most useful folders on your machine, as any shortcuts in there will be added to the right-mouse "Send To" sub-menu. Hence you can send any file to another folder or application regardless of its extension or association.

If your JPEG files are registered to a heavyweight slow-loading image processor, then you can bypass this by sending them to something like Paintshop instead of the default "Open". Or you can send any file to Notepad, and so on. The only problem is that it's a bit of a hassle to set up — you have to open the 'Send To' folder, then the folder containing the application, and drag a shortcut from the latter to the former. Richard Ansell came out with an idea so brilliantly obvious that I didn't understand it at first, which is why it has been lying unreported on my desk for several months.

From Explorer, right-drag the "Send To" folder on to the desktop and "Create shortcut here". Then, right-drag it back into the "Send To" folder and chose "Move". Rename it "This menu". Subsequently, any program file on which you right-click and send to "This menu" will have a permanent shortcut added to the menu.

One drawback is: don't try this with folders.It will copy or move the entire folder and its contents, so it's probably best used as a temporary measure to set up "Send To" shortcuts.

● Here's a tip for those trying to sort out modem problems. Windows 3.1 Terminal was just that: you could run the program and start typing command strings straight to the modem — ATZ, for example, to reset it, and ATDT 1234 to tone-dial 1234. With the new Windows Hyperterminal, this seems impossible as it asks you for a name and phone number before it will let you start. In fact, it isn't. The trick is to choose an icon and give the session a name, just to play along, then when the "Phone Number" dialogue appears go straight to the bottom box — "Connect using". Click on the arrow and select "Direct to COM 2" (or whichever port your modem resides at). You can then type away in Hayes-speak and converse directly with your modem.

Whisper sweet nothings to your modem in Hayes-speak
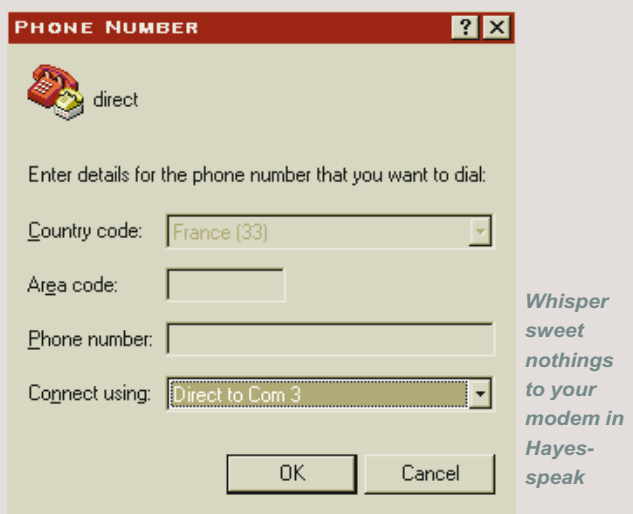
which other icons get out of the way in large or small icon view.

Another annoyance is the way folders are capitalised, or not. You can create a folder called "abc", "Abc" or even "ABc", but not, it would appear, "ABC". It seems this is because it isn't a long filename as far as Explorer is concerned. "ABCDEFGHIJ", however, will display in all-capitals as it's over the eight-character limit. Curiously, if you do try to create or rename a folder "ABC", the "long" filename will appear as you intended from the DOS "DIR" command, even though it's short. If you see what I mean.

If at first you don't succeed… give up

This month, I had the joyful task of re-installing Windows 95. One day, Windows suddenly decided that from that moment on, it no longer liked my PCI-bus Opti hard disk controller and would be running the File System in "MSDOS compatibility mode", which is the long way of saying "slow": so slow, in fact, that it couldn't read the "Microsoft Sound" off the hard disk at start-up without pausing for breath in the middle.

So I rounded up the usual suspects. Virus? Mr McAffee, he said "No". Moreover, booting back to Windows 3.1, whose 32-bit file access tends to fall sick at the slightest suggestion of a boot-sector sniffle, showed this was in excellent health. The Windows 95 Control Panel/System/Device Manager pinned the blame squarely on my startup files. There was an "unknown driver" in Config.sys or Autoexec.bat lousing things up.

This was rather mystifying news, as I didn't have a Config.sys or an Autoexec.bat. Rebooting with saved and known-to-be-good versions of the Registry and System.ini didn't help. Neither did making a Boot log and replacing the files shown to "fail" in Bootlog.txt. Nor did attempting to remove the defective controller from the Device Manager: Windows would lock solid. After scandisking, defragging and various other rituals I gave up and reinstalled Windows (and all my applications) from scratch. I'm pleased to say that the file system is back to its full 32-bit glory, and clearing the accumulated dross of the last few months means not only do I have acres of hard disk space, but Windows now goes like a train once more. I'm still mystified as to what happened, however, and why it should take a complete re-installation to repair it. ▪
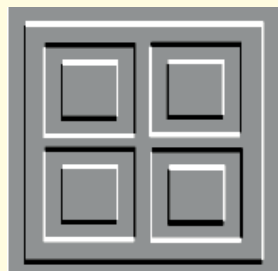
.Inf Formation

How to purge those troublesome redundant drivers from your system, and Plug-In presents you with a full system enhancement. With Tim Nott.

TWO MONTHS AGO I PROMISED that we'd take a closer look at third-party .INF files and how they can help you weed out redundant drivers from your system. Last month I broke that promise in order to fulfil another one made in December 1993, concerning DDE. So here comes the inf on the .INFs.

On a non-networked Windows 3.1 installation, there are three .INF files used for setting up:
● **SETUP.INF** contains all the general information needed, including lists of all the possible options and where to find the relevant files. If you run Setup from within Windows and choose Add/Remove Windows Components, you'll see the lists — for instance, Wallpaper and Sounds — that are stored in SETUP.INF. It also contains details of the Windows generic video drivers such as VGA or SVGA, as well as the standard mouse and keyboard options.
● **APPS.INF** contains information on third-party applications for setting up the correct PIF and icon settings.
● **CONTROL.INF** contains the list of standard printer drivers and international settings that are set up from Control Panel. The INF files are organised much as INI files, with section headings in square brackets, each containing keynames and values. They can be edited with a text editor, though you'd really only want to change them if you were custom-installing Windows on multiple machines.

No place like OEM
When a third-party video, printer or other hardware driver is installed in Windows

An OEM .INF file in the spotlight

3.1 it should come with its own .INF file, which is stored in the Windows\System subdirectory so it can be read by Windows Setup in "maintenance mode" — i.e. when you're changing system settings rather than installing Windows. If this has the same name as an existing OEM (Original Equipment Manufacturer) file, then it is renamed to OEMx.INF (where x is a number). These OEMx.INF files are linked to the Windows SETUP.INF file, so that all available display options are listed in one place. So, even if you've removed the driver files themselves, if the OEMx.INF file remains, you'll still see the driver listed as an option when you run Setup.

If you open an INF file in Notepad, one of the first sections you'll see will be "[disks]". This lists all the disks that the

setup program is likely to need, each identified by a number or letter. Obviously this will include the disk(s) supplied with the hardware, but may also include some of the Windows installation disks for resources such as screen fonts.

The next section — assuming we're looking at a display driver .INF file — should be "[display]" and this contains the nitty-gritty on the driver and supporting files. There may be just one line here or several, depending on whether separate drivers are used for different resolutions, or one "catch-all" driver is supplied with a separate utility for switching resolution. Each line is divided by commas into several sections. First comes the keyname or "profile" of the driver, used to refer to it elsewhere. Next follows an equals sign and the disk ID and filename of the driver (.DRV) itself. After that, in double quotes, comes the description — what you see listed in Setup, followed by three numbers that define the "aspect ratio" of the system

Looking Shifty

Some of the following have appeared before in this column, but here are ten really fascinating things to do with the Shift key.

1. File Manager
To tile Windows side-by-side, press Shift + F4.

2. File Manager
To save settings, press Alt + Shift + F4.

3. Program Manager
The same Shift + Alt + F4 trick works here, too. Unlike an unshifted Alt + F4 it doesn't close Program Manager. If you want to make sure the settings stay saved, untick Save settings on exit from the Options menu.

4. Starting Windows
Holding down Shift stops the Startup group from loading.

5. File Manager
Highlight a file, hold down Shift and select another: all those between will be selected as well.

6. Write and Notepad
Shift + Arrow keys selects text rather than just moving the insertion point. The trick also works with the Home, End, Page Up and Page Down keys.

7. Pasting
Shift + Insert pastes from the clipboard — handy for southpaws as you don't have to let go of the mouse.

8. Write
If you highlight some text then hold down Shift + Alt, the selected text will be moved to the location of the next mouse-click.

9. Program Manager
Shift + double-click starts an application minimised.

10. Paintbrush
Dragging a cutout with the Shift key held own paints the image with multiple copies of the cutout.

fonts — generally 100,96,96 for standard VGA or 100, 120,120 for large fonts. Next come five more disk IDs and filenames. The 286 "grabber" (*.2GR) is used for copying data from DOS windows in standard mode, and the *.LGO file contains code for the windows startup screen.

Next comes the Virtual Device Driver (*.386), also used for DOS sessions, followed by the (*.3GR) "grabber" for enhanced mode. There may follow an "ega.sys" entry, but usually this is skipped — you'll just see two commas.

Then comes the *.RLE file, the actual bitmap of the startup logo, as some OEMs like to install their own to remind you that you're using their wonderful equipment. And finally, an optional field to point to another section in the .INF file, that may contain details of other files that need to be installed.

Drive away
So, let's assume you've installed a new video card and want to get rid of the excess baggage from the old one. The first step is to create a "safe" directory and copy SYSTEM.INI and all the OEM*.INF files there. Next, open all the original OEM*.INF files with Notepad. You should then be able to pinpoint the redundant files and move them from the Windows\System directory to your "safe" directory.

If a file appears in both the old and new .INFs, then obviously it's not redundant — most *.FON files, for example, are the Windows standard. Check, too, the optional field mentioned in the previous paragraph: if a separate section appears in the old .INF for this, there may be further redundant files. The entries here have the format: File, Destination, System.ini, Section, Keyname, Value. If a line starts with two commas, it means there's no file involved, but there is a section or key in SYSTEM.INI that can be removed. When you've finished, you can delete the redundant OEM*.INF file — keep the "safe" backups until you're sure everything is working properly. You'll no longer see the old drivers listed when you run Setup.

VGA holds sway
Finally, there may be more. If your old card had its own icon in Control Panel, there will be a redundant .CPL file lurking in the System directory. Alternatively, if there is an icon in Program Manager, you can hunt the .EXE down with the File/Properties... command. It is not a good idea, by the way, to remove the standard Windows VGA driver files — VGA.DRV, VGA.2GR and VGA.3GR.
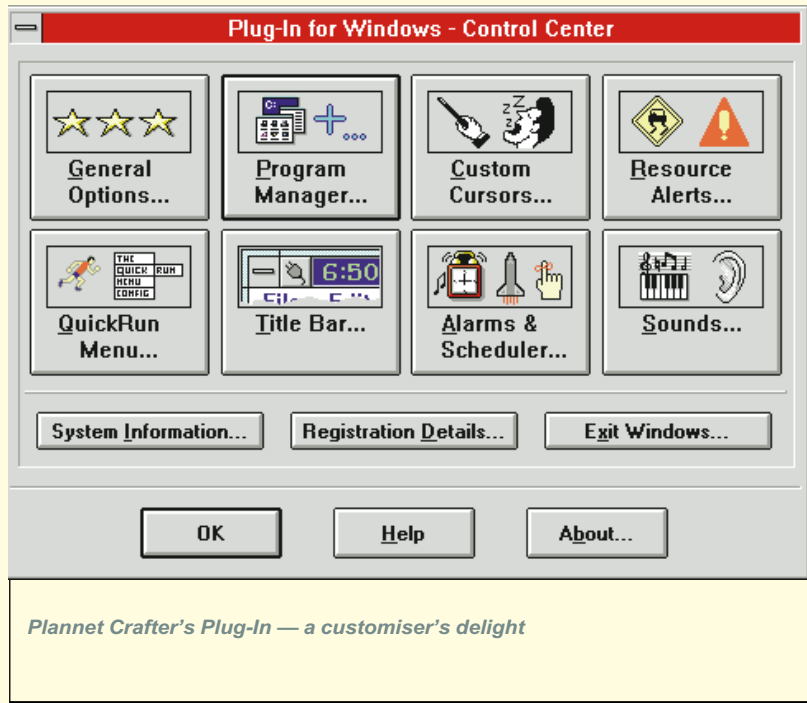
Plannet Crafter's Plug-In — a customiser's delight

Even if you never use standard VGA resolution, it's a great diagnostic aid. When a program (or Windows) won't run properly, the first thing to try is "does it work in VGA?"

Keep on Plugging

In September 1993 I was raving about Plannet Crafter's Plug-In, a shareware utility that added all sorts of enhancements to Program Manager and the Windows Interface in general. Since then it has won several awards, and this month brought a disk with version 2.6.

You can have nested Program Manager groups, groups can have their own icons, and you can have all sorts of additions — including date, time, resources, memory and disk space — shown in the title bar of applications. You can change the title-bar font, there's a range of wacky cursors and even a talking clock.

A little plug icon attaches itself to the title bar of all applications, with a configurable cascading menu system, so you can run one program directly from another without having to go via Program Manager.

What's really cool is that the menu is also available from a right-mouse click on the desktop, and you can use Plug-In as
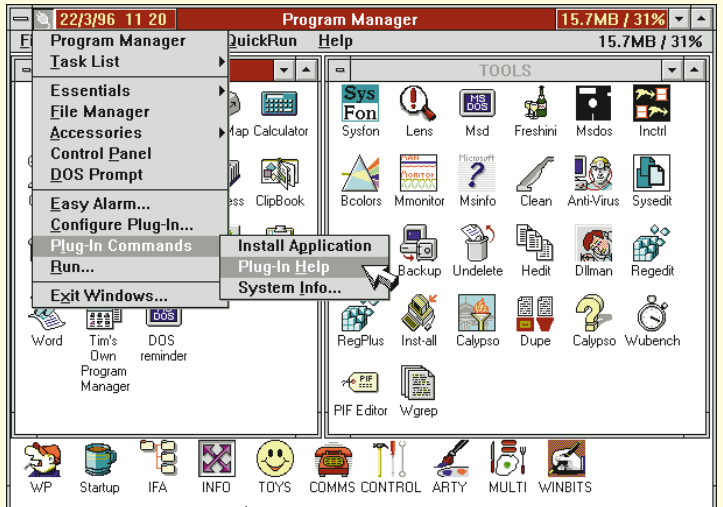
Plug-In's cascading menu allows you to run programs directly without having to go to the Program Manager

your "shell", the program that kicks off and exits Windows, instead of Program Manager. This is a strange experience when you first try it, as you start with a completely clear desktop (Windows 95 users, eat your hearts out). When you right-click, the shell — Plug-In's menu system — reveals itself. It's on this month's CD, or can be downloaded from ftp.uu.net (/vendor/plannet).

Type cast

Tim Phillips tackles TrueType fonts, and explains the four variations of embedding technique.

Fonts, fonts, fonts, fonts, marching up and down again" as Rudyard Kipling might have written on his word processor, had he lived in the TrueType age. There seems to be a lot of confusion about TrueType and the differences between TrueType fonts, so here's a quick explanation and glossary of terms.

TrueType is Microsoft's open font format, which was designed to improve on PostScript Type 1 fonts. Because TrueType fonts are supplied with Windows, they have very quickly come to dominate the font scene, and there's no reason why not: they are a good standard and in some ways better than PostScript.

Some history: the first fonts were "bitmap" fonts, drawn as a series of pixels, like colouring in squares in a grid. This was fine at the resolution intended, but once you make a bitmap font bigger, the pixellated appearance makes the shape "blocky".

PostScript changed the rules by describing each letter as a set of mathematical rules, which were represented as bitmaps on screen. PostScript fonts gave the best resolution possible for each device, be it a screen, a printer or a typesetter, without the need to change the font.

The problem is that screen-based fonts are often small, and screens have a terrible resolution — a quarter that of the worst laser printer. When the font is displayed in a small typeface, it can be unreadable, especially with letters that contain a lot of curves. The answer is a
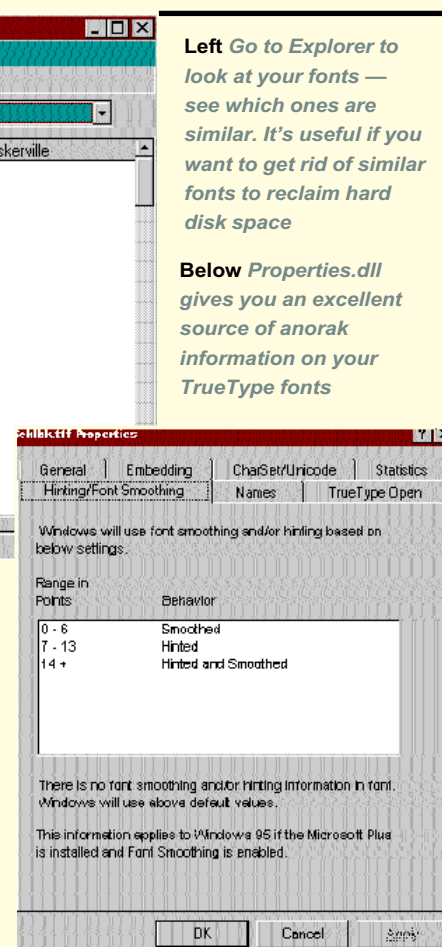
technique called "hinting".

Hinting takes the outline of a small letter and selectively fills in a few more pixels to make it legible. This used to happen in the old days, when fonts were made of lead; small letters used to be heavier and broader. PostScript has hinting, but it is very basic. TrueType's is far better.

Embedding fonts

In order to view a font, you must have it on your system. TrueType fonts are embedded in your document (that's why a word processor document with lots of fonts is so huge). But all embedding is not the same — in fact, there are four types of embedding.

The best is *installable embedding*. That means the font is effectively freeware, is embedded in the document and will install on any other PC that uses the document. The basic Windows fonts like Times New Roman are installable.

Next is *editable embedding*. This means that the recipient can temporarily

install the font on his or her PC while editing the document — it means, for example, that the font can be resized. The font will not install permanently.

Worse is *Print and Preview embedding*, the standard for commercially supplied fonts: for example, those supplied with another word processor. These are embedded in the document but, as the name suggests, are read-only. That means you can change the text that is displayed in the font.

Left *Go to Explorer to look at your fonts — see which ones are similar. It's useful if you want to get rid of similar fonts to reclaim hard disk space*

Below *Properties.dll gives you an excellent source of anorak information on your TrueType fonts*

On to a winning streak

A bumper crop of WinWord hints and tips, this time for those of you who have bought Office 95, in response to several of your frequently asked questions (FAQs). Not surprisingly, these frequently asked questions tied up with Microsoft's own list, which you can find on CompuServe or MSN. I make no claims to originality in these solutions, but I have exhaustively translated them from the original Microsoftese dialect. I am also in possession of the Word 6 list, so I'll be matching that with your FAQs next month.

Q. *Gosh, it says "Unable to open specified library" and my old add-ins like Internet Assistant and Word Assistant don't work with Word for Windows 95. Why?*
A. This is because the old components are 16-bit code and the new ones are 32-bit. "Unable to open specified library" means that the DLL you're accessing is 16-bit. If you're a macro programmer and you use Declare statements to access Windows API functions, you may know this one. You will also get WordBasic errors in Word for Windows 95 by using 16-bit macros with the instructions FileOpen, FileSave, and FileSaveAs. The macros may make invalid 16-bit API calls, or get confused by long filenames.

To stop the problem happening, delete templates and add-ins from the Word Startup folder. Use the Organizer, which is located in the Tools, Macros dialogue box to temporarily rename any FileOpen, FileSave, or FileSaveAs macros. Then rewrite them.

Q. *The Open dialogue box is impossible, isn't it?*
A. Yes. Action plan: make sure the option to Search Subfolders is not checked. This makes the search take ages and brings up too many files. It's only for use when you search for specific wildcards. Click Advanced and clear the check box. Then use the My Favourites folder and dump frequently-used documents in it. Create shortcuts to documents here. Then learn to use the buttons at the top of the box *(see screenshot, below)*: Details, Properties, and Preview buttons are all useful, especially the preview button, as it is much faster than other wp previews. I leave this as my default. Additionally:
List: filenames listed in columns, from left to right.
Details: more information about the file (size, type, and date the file was last modified).
Properties: a two-paned window is displayed that shows filenames and folder tree in the left pane and the document statistics and summary information for the selected file in the right pane.

Q. *Oi, where's the Grammar Checker and WordArt gone, then?*
A. You installed the default setup, which doesn't include them. I agree with this, especially as I was so rude about grammar checkers in a recent column.

To install WordArt and the Grammar Checker, run Setup again. To start Maintenance Setup, find the Office folder and double-click Setup. Click Add/Remove, and you will find WordArt in Office Tools and the Grammar checker in Microsoft Word Proofing Tools.

The Open dialogue in Winword, showing the preview view. Try it, you'll be surprised at how quick it is
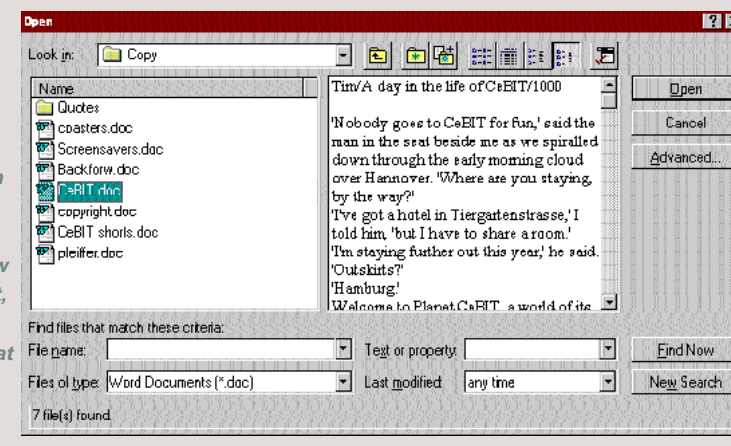
Nastiest of all are the *restricted licence fonts*, which do not embed at all. Use one of these in a document, pass the document on, and the recipient has to install the font separately before it can be viewed.

If you want to know more about your fonts under Windows 95, I suggest you mail me and request a file called Proper-

ties.zip. It installs as a .DLL and displays all the information about that font when you right-click on the font icon (in the Fonts directory in Windows). The screenshot *(left)* shows what it does. It's a little on the nerdy side, but potentially useful nevertheless. There'll be more on the subject of fonts next month. ➔

Tim's incredibly popular macro club

"**G**o on, you can all come in," he said, door policy not being a phrase in my vocabulary. And you know what else? I'm not only going to pass you a WordPerfect macro, but a really long one, too.

It's so long, in fact, that I've had to put it on this month's cover-mounted CD-ROM. If you are a WordPerfect user and you can't get it off the CD-ROM, I'll mail you a copy.

The macro in question is from the admirable Jean-Luc Addams, who has risen to meet the challenge of writing a macro to publish booklets in Landscape A5 format. It handles justification and a starting page

Jean-Luc Addams' WordPerfect 5.2 macro in operation. Simple, but effective in a time of need for all WordPerfect users

number, and uses a dialogue box to start things off. If you want to save time you can leave out the documentation, but I left it in.

When the macro is running, it will place a number at the bottom of each column of text; at two columns across an A5 landscape page, you have a booklet. (Monsieur Addams has also provided a great initial caps macro, which I'm saving for next month.)

Now, all you so-called WordBasic programmers, get to it.

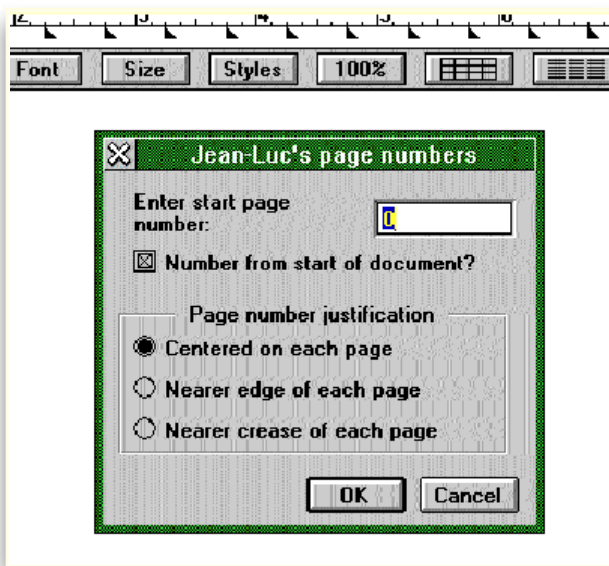Finally, just a quick word for the user who asked me how to type in a macro: under Word, select Tools, Macros, New. Under other software it's similar but I recommend you look it up in the manual. If you can't find it, you've got one of those word processors where macros are meaningless.

Under new management

WordPerfect offers some good news for confused users. The free support that used to be a major selling point of the product (and which was discontinued by Novell) will be reinstated. Corel will be selling PerfectOffice as Corel Word-Perfect Suite and Corel Office Professional (to be reviewed in *PCW* soon).

The 32-bit version is now targeted for June delivery, only a year after Microsoft Office became available in a 32-bit ver-

sion, and Corel is promising a whole rash of widget-sized utilities to make the suite more attractive. These include the Side-kick information manager, and Dash-board, a program manager replacement that is largely redundant under Windows 95 and, based on my limited exposure to it, positively irritating.

Corel admits to a seven percent market share: half that of Lotus. The remainder of the applications market is mopped up by you-know-who.

More on those pesky viruses

They might well have pooh-poohed me when I forecast terrible consequences after the first word processor macro virus was created, but I was right: the US-based National Computer Security Association (NCSA) has found the Word "Concept" virus to be the world's most, er, "popular" virus.

For those of you lucky enough not to be familiar with viruses, let's recap. A word processor hosts a virus which lives inside a document. The document contains an auto-execute macro, which spreads the virus when the document is loaded.

Concept was the first of its type and despite Microsoft having tried to label it as a "prank macro", it is still a virus.

At the NCSA's January conference, 90 percent of attendees had been infected in the past year. Concept is the most preva-lent; it spreads quicker than traditional viruses, because more people swap docu-ments than exchange executables.

● If you want to check whether you have Concept, look at Tools/Macros. If you have a macro whose name begins with "aaa", you've got it: so contact Microsoft and get a fix for it, which also inoculates you. It's available from www.microsoft.com as well. ■

Learning online

The Microsoft Network had to be good for something. Although I can't personally vouch for the quality, you might be interested in trying out its online application training conferences. There's only one for Microsoft Word at the moment (unsurprisingly, nothing for any other package) but at $120 (about £80) it is cheaper than formal training. You have a series of online tutorials and the chance to enter into some chat sessions with other learners.

If anyone has been brave enough to give online learning a try, let me know what it was like and I'll pass on your views.
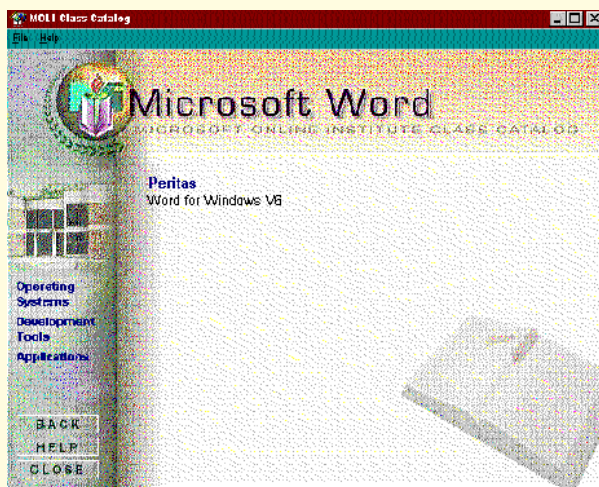
The solitary Winword course at MSN's Microsoft On-Line Institute
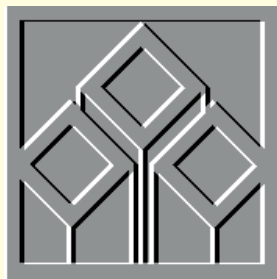
Just in **time**

Without a big computerised system, how do you keep track of your business? Stephen Wells has a suggestion. Plus, Excel's Camera gets cute.

Excess warehousing is anathema to manufacturing companies. Having raw materials, parts or finished product sitting around is not an efficient use of assets. Storing, insuring, and handling depreciating stock just adds to costs. That's why the theory of Just In Time became popular. In large companies, MRP (Materials Resource Planning) is considered a vital element of manufacturing. They want new supplies to arrive in the nick of time, but not before.

But what of small companies? They can't afford massive computerised systems. No problem, while there are resourceful managers like Steve Evans who works for a company near Pontypridd, Mid Glamorgan, that makes a highly specialised medical product. I won't tell you what it is or you'll feel queasy. But the relevant point is that the component parts are expensive and date quickly, so he's devised an Excel worksheet which tells him when to order them *(Fig 1)*.

The original covers six months and includes a long list of component parts. I've just shown a snippet or you wouldn't be able to read it.

Cell A7 has the TODAY() function. The rest of column A is for the part numbers that require tracking. Column B displays the parts descriptions.

C14 to I14 are the codes for the products to be built. C16 to I22, in this brief example, contain the number of each part contained within each of the products — effectively a parts list. Thus products A, V and O each need one of the first four listed parts.

J16 to J22 contain the current stock levels for each part. These are typed in by hand. M4 contains a date within the first month of production being monitored. The following five months run on out to the right in a similar fashion.

K6 to 12 contain the products to be built again (with a fuller description) and L6 to L12 the quantity planned to be built. This is repeated in the following periods.

K16 calculates the total number of the part on row 16 required during the period. The formula is

`=SUM((L$6*C16)+(L$7*D16)+(L$8*E16)+(L$9*F16)+(L$10*G16)+(L$11*H16)+(L$12*I16))`

The quantity to be built is given in absolute terms so the formula can be dragged down the column.

Incidentally, I can't help thinking there should be some way of multiplying named ranges as an array and simplifying that formula. If any reader has an idea on that I'd be glad to hear from them.

L16 is a simple calculation of the current stock levels minus the quantity required that period:

`=SUM($J16-$K16)`

The formatting is in red to show up when to order, and in this case they are short of 427 parts.

In the next column, M16 looks at the value in L16 by the function

`=IF(L16 < 1,M$4-56," ")`

If it is less than 1 (negative) then this part needs to be ordered. The date the order should be placed allows for a delivery time from the supplier of 8 weeks. So, 56 days are subtracted from the date in M4. If the value in L16 is greater than 1, then no date is displayed. This is repeated for the remainder of the parts for that period and subsequent periods.

Staffing up

The second spreadsheet from Steve Evans reminded me of a song from The Pyjama Game, the musical about factory unions: "Seven and a half cents doesn't seem a helluva lot…"

They were fighting for higher rates paid per hour. Today, the negotiation is over the number of hours worked. Fortunately for manufacturers, there are more people today who want to work part-time. In this factory, Steve tells me, about 20% of the employees do not work full time, so he also uses a spreadsheet to calculate

Calculating the number of parts to order and when to order them for a specialised medical manufacturing company

Calculating the number of part-time workers who will be needed during specified periods in the same company

staffing requirements *(Fig 2)*. I've had to eliminate a lot of his attractive spacing and formatting to capture all the essential parts in one screen.

In the block B7:E17 is recorded the time, in parts of an hour, it takes to make, assemble and test each part or sub-assembly. The quantity of each assembly needed in the first period is recorded in column F. In columns G to J are the total hours to be taken for each type of work. The same calculations for further periods continue in columns out to the right.

In rows 19 to 22 it is therefore possible to total the number of hours of work required in the period for each speciality. The total hours to be worked is given in row 24.

To this has to be added a weighting for typical sickness, holidays and the traditional tea-breaks here entered in rows 27 to 29.

The sum of all these hours is now divided by 150 in row 31. This is the figure that they use as total working hours in the month. (They must spend Friday afternoons at choir practice.)

And so it is that row 31 indicates that, arithmetically, 5.4367 people are required for these duties in this month. This is then broken down into the number of people required in each production section and displayed in cells G33 to J33. The formula in G32, for instance, is

`=SUM((G19+(I27+I28+I29)/4)/150)`

The system has also been used to calculate the effect of changing the batch size of various products. This has required the expansion of each of the sub-assembly times to include setup time and run time.

Setup will usually take the same amount of time regardless of how many products are required to be made, whether 1 or 1,000. Run time is directly related to how many are required; therefore, changing the batch size has a direct relationship to the productivity of the manufacturing unit.

I've included these two spreadsheets this month not because they make any startling breakthroughs in application development, but, their very existence is indicative of the advances which have been made in the last decade. Now we have managers in small companies showing initiative and using spreadsheets to improve their efficiency.

Meanwhile, back at the hospital

Speaking of things medical, I've received a follow-up email from Dr H Baillie-Johnson whom you met in the March column. He had asked for a macro for entering and shifting data, and I gave him an auto-recorded one as it's the fastest way to program in VBA (Visual Basic for Applications). I was grateful at the time to the smart sub-editor who italicised my comment that, medically speaking, the example I gave was nonsense.

I'm even more grateful now when I find out what Dr B-J does with his spreadsheet. After praising my "elegant solution", he says he uses it to help calculate doses for ten different drug cocktails used in cancer chemotherapy. I tell you, I went cold. I didn't know whether to be honoured to have made a minuscule contribution to medical science, or scared witless in case I'd made a mistake. There are times, dear readers, when I'd rather not know what you're doing.

A reader who has concealed his application well is Mark Campbell, an NHS unit manager in Newcastle. He emailed a problem with an attached file to illustrate it.

Mark's using Excel 5. His nose is out of joint because the Apply-to-all checkbox option in Excel 4's Format, Patterns dialogue box has disappeared in version 5. He wants to be able to create a multiple-series line chart with all the markers the same size, shape and colour. Goodness knows why, but with these medical chaps I don't ask.

"I can Format, Patterns as many times as needed, but this is tedious when we often have more than 60 series," he says.

Well, what I'd do is select Tools, Record New Macro, then go through it once. Apply a shortcut key to the macro. Then, in future, you just have to double-

282
PERSONAL COMPUTER WORLD
JUNE 1996

283
PERSONAL COMPUTER WORLD
JUNE 1996

click the chart to select it, and press Ctrl+f or whatever you've chosen.

That's how I initially produced the following macro to do the job. Then I tightened it up by putting the main routine in a GoSub statement and substituting the variable X for the number of the series.

When viewing the module sheet, you can see all the possible colour reference numbers, from 1 to 56, by clicking on the keyword, `MarkerBackgroundColorIndex` and pressing F1. Similarly, you can see the descriptions of all the shapes available for Markers by clicking on MarkerStyle and pressing F1.

To use this macro, just choose Insert, Macro, Module then type in the listing. The new sheet will appear as the last tab but you can move it up front easily with a right-click. And you can rename it with a double-click.

The listing is shown in *Fig 3*.

Photo fit

Here's the cutest idea I've seen in a long time. I downloaded the gist of it from the Excel Forum, though I've refined the idea.

I've always known that if I made an entry into an Excel spreadsheet cell, any existing content would be deleted. Also, a function statement always has to refer to any other cell(s) than the one it is in. I was wrong on both counts.

Supposing you want a form just to display capitals. If the user enters n, for no, or y for yes, then the cell would display N or Y.

You could write a macro but it's not necessary. What you need is the Camera tool. If you can't find it, go to View, Toolbars, Customise, Utility. Then drag and drop it on to any toolbar.

Let's assume you want the entry cell to be D7. Go to some distant cell, say AZ90, and enter =UPPER(D7). Then select cell AZ90 and click the Camera button, hold down the Alt key and click on cell D7. What you're doing is creating a picture of the formula.

Now, while the object is still selected, choose Format, Object, Border - None; and Fill - None. This conceals the object.

Click elsewhere on the sheet to de-

Fig 3 Medical checkbox macro

```
Option Explicit
' Formatting Macro
' Keyboard Shortcut: Ctrl+f
Sub Formatting()
Dim X
X = 0
For X = 1 To 60
    ActiveChart.SeriesCollection(X).Select
    GoSub Routine
    Next
    Exit Sub
Routine:
        With Selection
        .MarkerBackgroundColorIndex = 5
        .MarkerForegroundColorIndex = 5
        .MarkerStyle = xlCircle
            End With
    Return
End Sub
```

select the object, and then select cell D7 and choose Format, Font, Colour - White. This hides the new entry so if you enter any lower-case letters, they only display as capitals.

A variation is to use another formula. For instance, `=IF(D7="y","Y",IF(D7="n","N",D7))` would only capitalise those two letters and not any others. You could as easily turn an entered "n" into "NO" or any word.

Ain't misbehaving

Ask not why your spreadsheet is messing you up. Ask if you're messing up your spreadsheet.

The cursor moves to the right after you've made an entry and pressed Enter. In Excel, you can clear the Move Selection After checkbox under Tools, Options, Edit in Excel. In practically any spreadsheet, you can press the arrow key for the direction of your choice after entry. It will also finalise the entry.

Your printout is not as you intended. Always mark the Print Area before you start; and go through the many options under File, Page Set-up carefully. Check the orientation, margins, scaling, headers and footers. Also, check the Black and White option if you don't have a colour printer but are displaying colour formatting. It can speed things up.

Converting from 1-2-3 to Excel

In the March column, Denzyl Pereira requested a macro to make a bulk conversion of *.wks files to *.xls and frankly I wasn't that helpful. Now to the rescue comes Chris McCarthy of Birmingham, who has emailed a solution that I've tried and it works for me. The macro found the right files and did the business, as they say in some parts of the capital. Here's the listing:

```
Option Explicit

Dim FileToConvert As String
Dim FileConverted As String

Sub MultipleConvert()
ChDir "C:\windows\temp"
FileToConvert = Dir("*.wks")
While FileToConvert <> ""
    Workbooks.Open FileToConvert
    FileConverted = Left(FileToConvert, Len(FileToConvert) - 3) & "xls"
    ActiveWorkbook.SaveAs Filename:=FileConverted, FileFormat:=xlNormal
    ActiveWorkbook.Close saveChanges:=False
    Kill FileToConvert
    FileToConvert = Dir("*.wks")
Wend
MsgBox ("All *.wks files in temp directory converted")
End Sub
```

You can either adjust the instruction to change directories, or copy the files you want to convert in to that directory. I would add that the conversion of the files is done automatically when the macro opens the Lotus 1-2-3 file and uses the SaveAs function to save it in the Excel format. It works just the same as if you did it manually.

As Excel will automatically open files in numerous formats, there are many other options for you than the .wks extension; and you can save the file in a myriad formats by changing the .xlNormal extension.

PCW Contacts

Stephen Wells welcomes comments on spreadsheets, and solutions to be shared, via *PCW* Editorial at the usual address or **Stephen_Wells@msn.com**. Files can be attached if you're on MSN.
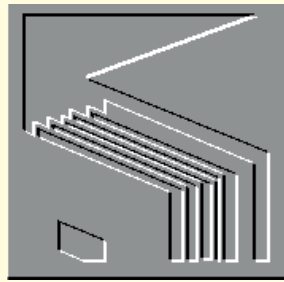
Meter **mania**

The meter readings problem has sent Mark Whitehorn's postbag level off the dial and offered up an alternative view.

The meter reading problem which first appeared in the March issue, continues to fascinate people (myself included). One reader is, however, convinced that I have missed the point. He feels that the real problem lies not in the SQL required to extract the data, but way back in the structuring of the original table I supplied. He is convinced that it isn't normalised to third normal form, and that the entire problem is easier to solve if the table is normalised to this level.

Challenging meter reader

The following is paraphrased from several email exchanges on the subject.

"The main problem stems from the fact that you have failed to identify that each meter reading is in itself an item of interest and should therefore have an individual

The original table structure I suggested for the meter problem…

…and the table suggested by a reader. Which one is normalised? Which one will be faster to query?

unique identifier. It is often true that combining data fields in order to arrive at a unique index means that the data design is potentially incomplete. It can be useful to retrieve items in this way as it may speed up searching, but it is often more desirable to have a separate unique item key.

"Thus, by adding (as a counter type) a ReadingID field at the front of your table and then the rather obvious PreviousReading at the end, we end up with a five-field table to deal with using ReadingID as the primary key.

"PreviousReading contains the ID of the previous reading and, to make the initial conditions easier, can point to itself if there are no previous readings."

At this point, the discussion moved to one about third normal form:

"Nowhere does it state (in Codd's
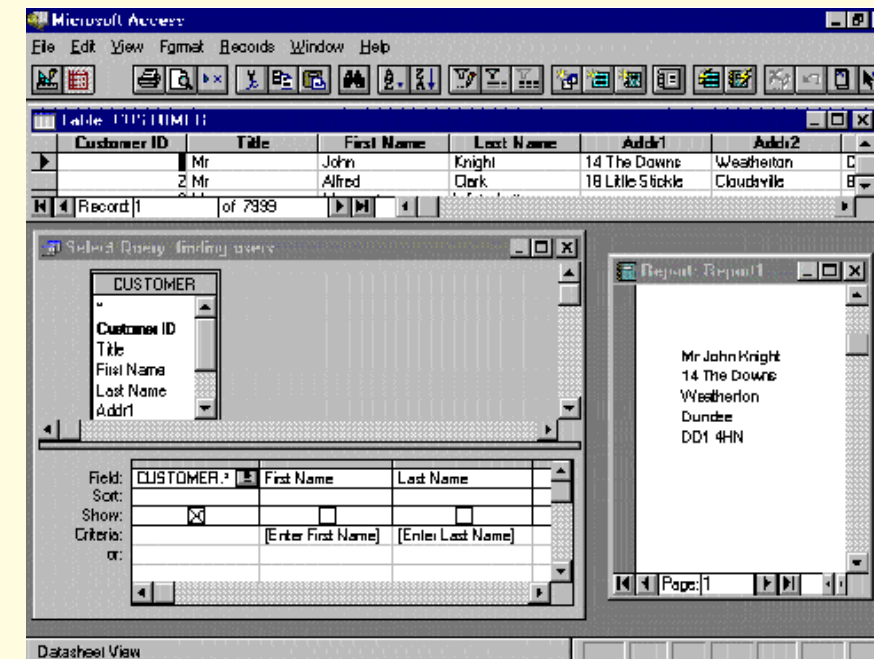
rules) that you can simply add together other fields to make up your unique identifier. The use of a single unique key is indeed needed in order to satisfy third normal form.

"This sort of 'I can add things together to make it fit the rules' approach causes more problems that any other aspect of database design. Please go away and re-read Codd. You will see that the only way the data can be produced in third normal form is by the addition of the field I suggest, not by combining two other fields to make it work.

"The solution I proposed in fact meets third normal form, in the same way as yours does. You may just argue that this extra field is redundant as it reproduces the information you already have, but that is to miss the basic advantages and simplification that it gives. You cannot claim that it breaks third normal form. (If you consider that each unique ID only relates to one combination of Meter/Date and vice-versa,

A parameter is easy to set up. Enclosing a criteria entry in [square brackets] means that, when the query runs, it will ask you for the relevant data (shown on the right of the screen)

you will see this.)

"I repeat. If you have to add together two fields to make up a (primary) key, it is almost certain that you have missed the need for a unique identifier. Such was your case. Each record as taken by the meter-reading man stands alone as a separate item and should be identified as such. It may be convenient to refer to it by other fields, but that is not the point."

It is clear that we disagree fundamentally about the way in which this table should be structured in order to comply with the relational model. Inevitably, I think that I am right, but that proves nothing in absolute terms — have you ever met any database people who *didn't* think they were in the right?

More interesting than who is right or wrong is the fact that the two solutions provide an interesting compare and contrast exercise:

1. Which one do you think is flawed in terms of the relation model, and why?
2. To what update and delete anomalies does the flawed one lead?
3. Which one will be faster when queried?
4. What are the implications of using each table in a real database?

Singled out

"Can you tell me how to get access to print one label instead of a complete list?"
ENSC1EM1@tay.ac.uk

The trick is to base your report on a query which lists only the single label that you want to print. In fact, if you want to be flash, you can base the report on a parameter query. A parameter query is one which asks you for the condition (for instance, the name of the person for whom the label is destined) before it runs.

So, when you run the report, it will run the parameter query; the parameter query will ask you for the name, and the report will print the label!

Sounds complicated, but it should be simple to use.

Table 1

EmployeeNo	FirstName	LastName	DateofBirth	DateEmployed
1	Bilda	Groves	12/04/56	1/5/89
2	John	Greeves	21/03/67	1/1/90
3	Sally	Smith	1/05/67	1/4/92

Table 2

SaleNo	EmployeeNo	Customer	Item	Supplier	Amount
1	1	Simpson	Sofa	Harison	£ 235.67
2	1	Johnson	Chair	Harrison	£ 453.78
3	2	Smith	Stool	Ford	£ 82.78
4	2	Jones	Suite	Harisonn	£3421.00
5	3	Smith	Sofa	Harrison	£ 235.67
6	1	Simpson	Sofa	Harrison	£ 235.67
7	1	Jones	Bed	Ford	£ 453.00

Table 3

SaleNo	EmployeeNo	Customer	Item	Supplier	Amount
3	2	Smith	Stool	Ford	£ 82.78
5	3	Smith	Sofa	Harrison	£ 235.67
213	3	Williams	Suite	Harisonn	£3421.00
216	2	McGreggor	Bed	Ford	£ 453.00
217	1	Williams	Sofa	Harrison	£ 235.67
218	3	Aitken	Sofa	Harison	£ 235.67
225	2	Aitken	Chair	Harrison	£ 453.78

Table 4

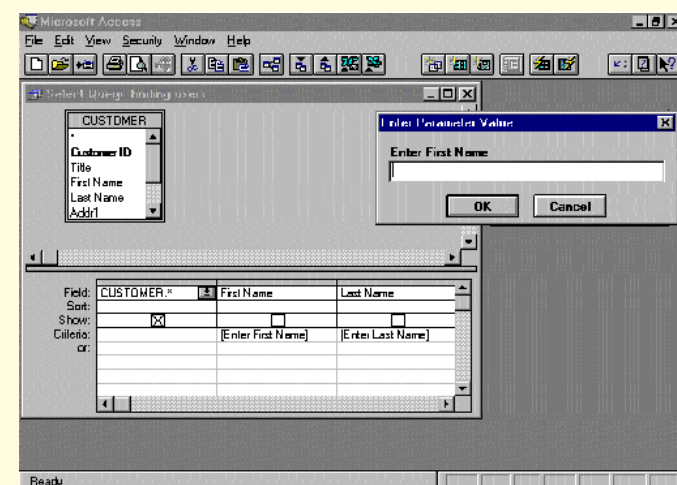| SaleNo	EmployeeNo	Customer	Item	Supplier	Amount
1	1	Simpson	Sofa	Harison	£ 235.67
6	1	Simpson	Sofa	Harrison	£ 235.67

● *Please email me, or write in and let me know what* you *think.*

Is it a bird? Is it a bug?

The question of speed in the meter problem is also of some interest. The different solutions suggested clearly have different speed implications and different update potentials. I started (as promised) to have a look at this, but I have been unable to come to a final conclusion for the intriguing reason that some of the tests are hanging Access. Is it a bird, is it a bug, is it my PC? Microsoft and I are, as we say in the trade, engaging in meaningful discussions. I'll keep you posted.

And so, to SQL

It was clear from the meter problem that many people wanted the subject of SQL covered for its own sake, so here we go. But first, a little background.

Data manipulation is a really important part of the relational model. After all, there is little point in storing data correctly, safely and securely, if that is all you ever do with it. Stored data has no value if you cannot question it and extract the data in some way for humans to examine. SQL is the language typically used for data manipulation and this, like most languages, has a set of commands. These commands in their turn are based on a set of fundamental operators.

In order to get the best from SQL, it is worth having at least a passing acquaintance with these operators. They are rarely used directly, but in my experience they keep cropping up in conversations about SQL. Knowing nothing about them can leave you at a social disadvantage. Trust me, it's worth knowing.

The only qualifier I need to apply is that the definitions I give are not complete to the relational model. For example, I say below that: "In order for tables to be 'Union Compatible', they must have the same number of fields, and the fields must be of the same data type and size." In fact, to be truly Union compatible, the fields must also draw their values from the same domains.

However, this level of pedantry is counter-productive, since most RDBMSs do not even support domains. So, as in the past, I will sacrifice exact mapping on to the relational model for practicality/readability.

The relational operators

Most of us are familiar with the standard algebraic operators (+,-,* and /) which signify addition, subtraction, multiplication and division. We use these operators to manipulate numerical values, or variables which represent values, almost without thinking. Thus, if we know that

```
A=5, B=6 and C=10
```

and that

```
D=A+(B*(C/A))
```

we can calculate that

```
D = 5+(6*(10/5))= 5+(6*2) = 5+12 = 17
```

In a database, we store the data in

Table 5

SaleNo	EmployeeNo	Customer	Item	Supplier	Amount
1	1	Simpson	Sofa	Harison	£ 235.67
2	1	Johnson	Chair	Harrison	£ 453.78
3	2	Smith	Stool	Ford	£ 82.78
4	2	Jones	Suite	Harisonn	£3421.00
5	3	Smith	Sofa	Harrison	£ 235.67
6	1	Simpson	Sofa	Harrison	£ 235.67
7	1	Jones	Bed	Ford	£ 453.00
213	5	Williams	Suite	Harisonn	£3421.00
216	2	McGreggor	Bed	Ford	£ 453.00
217	1	Williams	Sofa	Harrison	£ 235.67
218	4	Aitken	Sofa	Harison	£ 235.67
225	4	Aitken	Chair	Harrison	£ 453.78

Table 6

SaleNo	EmployeeNo	Customer	Item	Supplier	Amount
3	2	Smith	Stool	Ford	£ 82.78
5	3	Smith	Sofa	Harrison	£235.67

Table 7

SaleNo	EmployeeNo	Customer	Item	Supplier	Amount
1	1	Simpson	Sofa	Harison	£ 235.67
2	1	Johnson	Chair	Harrison	£ 453.78
4	2	Jones	Suite	Harisonn	£3421.00
6	1	Simpson	Sofa	Harrison	£ 235.67
7	1	Jones	Bed	Ford	£ 453.00

Table 8

SaleNo	EmployeeNo	Customer	Item	Supplier	Amount
213	3	Williams	Suite	Harisonn	£3421.00
216	2	McGreggor	Bed	Ford	£ 453.00
217	1	Williams	Sofa	Harrison	£ 235.67
218	3	Aitken	Sofa	Harison	£ 235.67
225	2	Aitken	Chair	Harrison	£ 453.78

Table 9

SaleNo	EmployeeNo	Customer	Item	Supplier	Amount
3	2	Smith	Stool	Ford	£ 82.78
5	3	Smith	Sofa	Harrison	£235.67

Table 10

SaleNo	EmployeeNo	Customer	Item	Supplier	Amount
3	2	Smith	Stool	Ford	£ 82.78
5	3	Smith	Sofa	Harrison	£235.67

tables (also known as relations) and the relational model provides a set of operators (known, therefore, as relational operators) with which we can manipulate tables (that is to say, relations). The discerning, sensitive reader will have noticed that I am showing a slight tendency to slip into "database-speak" at this point. I do so only because, without using the terms, expressions such as "Relational Operators" do not make much sense.

However, it is worth noting before we begin that tables are relations, and relations are sets. Four of the relational operators (Union, Difference, Intersection and Product) allow us to perform traditional set operations.

In order to demonstrate these operators we need a sample table or three *(see Tables 1, 2 and 3)*.

Restrict (aka Select)

Restrict simply extracts records from a table. Thus, if we perform a restriction on the table SALES where (Customer) = "Simpson", the result would be as shown in *Table 4*.

Union

Union creates a new table by adding the records of one table to those of another. Clearly, for this to work well it is essential that the tables have the same structure. The union of tables *Sales* and *Employees* is unimaginable because the two tables are clearly very different in structure. In order for tables to be "Union Compatible", they must have the same number of fields, and the fields must be of the same data type and size. The tables (*Sales* and *Sales2*) are "union compatible" and the result would be as shown in *Table 5*.

Note that the two records shown in *Table 6* were shared by the two tables, but have appeared only once each in the ANSWER (*Table 5)*. The order in which records appear in the result of a union is unimportant, but duplicate records are eliminated.

Difference

The difference of two tables is a third table which contains the records which appear in the first but *not* in the second. The tables concerned must be union compatible. Thus the difference of SALES (*Table 2*) and SALES2 (*Table3*) is shown in *Table 7*.

Note that, unlike Union, the order of the tables is vital. Thus the difference of SALES2 and SALES is not the same *(Table 8)*. However, the records that are "missing" from the two ANSWER tables are the same *(Table 9)*. That is, in both cases it is the records that are common to both of the tables involved in the difference operation.

Intersection

The intersection of two tables is a third table which contains the records common to both of them. Thus, the intersection of SALES and SALES2 is shown in *Table 10*.

Unlike the difference operation, the order of the tables is unimportant, but, of course, the two tables must be union compatible. ■

PCW Contacts

Mark Whitehorn welcomes readers' correspondence and ideas for the Databases column. He's available on **m.whitehorn@dundee.ac.uk**

Seven Software Servers

The idea is that any combination will work together, meaning the user should have to do less work. Terence Green tries it out. Plus, more new OS/2 utilities.

I've been using OS/2 as my primary desktop system for some years now and have become inured to the endless number of "OS/2 is dead" stories. So it was no surprise when the story re-appeared following the news that OS/2 for the PowerPC was being put on the back burner for 1996, while IBM went at the Intel version.

So many people believe that anything associated with IBM and OS/2 is bad that even when the company finally makes a serious public commitment to OS/2, the story is spun around. There are millions of Intel PCs out there. There are very few PowerPC systems. Where would you put your development for 1996?

So far this year we've had Warp Server and IBM Software Servers, announced and shipping. There's also a Secure Internet Connection Server and browser which makes business on the Web less dicey. A Java-enabled Web Explorer should be around by the time this issue is in your hands. Merlin, the next revision of Warp, should be in Beta by then, too. And Warp SMP is nearly ready to roll.

Still, I expect the noise to become even worse now that IBM Software Servers have been announced with a commitment to ship them on Windows NT as well as OS/2 and AIX.

IBM supporting Windows NT? This couldn't possibly mean that IBM has recognised the reality of open distributed systems could it? But it *must* mean that.

The Eagle takes flight

IBM announced its Software Servers at the end of March. Formerly codenamed "Eagle", IBM Software Servers is the family name for a group of seven applications servers which it will make available for IBM AIX, IBM OS/2 Warp and Microsoft Windows NT this year.

Later on, IBM plans to ship the Software Servers on other Unix platforms, too. At least I guessed right when I mentioned this two issues ago but I was sadly mistaken when I suggested that OS/2 would be the first platform to sport a full working set of the seven applications servers that make up the Software Servers product. In fact, the AIX Software Servers will be the first complete set to ship.

The OS/2 set of seven was ready to ship in March, with the exception of the Directory and Security Server and the Systems Management Server which will ship towards mid-year. Of the Windows NT set of seven, only Lotus Notes is ready now while the rest will trickle in between now and the autumn.

The premise behind IBM Software Servers is that any combination will work together. In other words, IBM is doing the integration work and testing rather than leaving it to customers. As customers, of course, we expected this to happen anyway but somewhere along the line the

Those Software Servers in full (with the exception of the OSF Directory and Security Services (DSS) server)
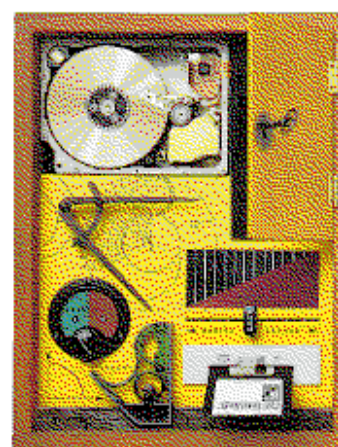
PartitionMagic: live on the bleeding edge with software that does weird things with your hard disk partitions

PC industry kind of forgot this part of the deal.

You only have to cruise through the technical support databases of IBM,

Free WWW services

GoServ is a free EWS Web server but it may be slightly overshadowed now that IBM has decided to copy Microsoft by making its Internet server (Internet Connection Server for OS/2) freely available for download. Even so, it's worth a look if you're toying with the idea of putting up a Web server.

GoServ was written by Mike Cowlishaw, a highly-regarded programmer based at IBM UK's Hursley laboratory. Cowlishaw is also responsible for REXX, the programming language included in OS/2 and as a result GoServ's usefulness can be extended using REXX. Cowlishaw must be a busy guy; his latest project is porting Java to OS/2 and AIX.

At the time of writing, the Web Explorer home page (see www.raleigh.ibm.com) promised a Java-enabled Web Explorer update in early March. Curiously, IBM is also working on a Java-enabled browser for Windows 3.1.

You would expect Microsoft to do something about this but it's focusing on its 32-bit operating systems. IBM, on the other hand, is determined to prove that it is agnostic about user preferences and as Windows 3.1 still accounts for the vast majority of desktop systems, the company is continuing to support it.

Microsoft and Novell, to name but three, to see how they've done so far: try to manage NetWare 4.1 and NetWare Directory Services from a Microsoft NetWare client for Windows 95, as an example. Funnily enough, during testing of the Software Servers, IBM discovered that a fully-configured database server and communications server "just argued" — as an anecdote it's funny but not if you're a customer.

The full set of IBM Software Servers includes database, communications, Internet, Notes, transaction services, systems management and directory and security services. I've been playing with the Beta of IBM Software Servers for OS/2 of late but I want to see the full set, in a box and ready to roll before getting too excited.

Warp Server provides the OS base for the OS/2 Software Servers and the file and print services. It shipped at the end of February. It combines Version 5 of LAN Server and Warp and includes file and print sharing, systems management, backup and recovery, remote access, advanced print function, TCP/IP and LAN Internet access.

At the launch event in San Francisco, IBM demonstrated Warp Server running on a four-way SMP system. SMP support should become available as a free upgrade later on in the summer. Oracle, Sybase, Lotus, Compaq and Hewlett-Packard are among those assisting IBM with the development.

OS/2 utilities

OS/2 is well-supported by utilities. There are hundreds of free, shareware and shrinkwrap tools, ranging from the very neat PartitionMagic 2.0 (which manages

290
PERSONAL COMPUTER WORLD
JUNE 1996

291
PERSONAL COMPUTER WORLD
JUNE 1996

I use DINFO to keep an eye on my swapfile and drive statistics, and CLOCKGS to place a small time and date bar at the bottom of my desktop

FAT and HPFS partitions), to GoServe an efficient freeware World Wide Web server.

In addition to shareware and the stuff you have to pay for before you can see whether it works for you, there is a plethora of OS/2 software written by IBM employees which can be found in OS/2 forums on CompuServe and IBM Internet sites. It is free and is tagged as EWS (Employee Written Software). I use DINFO to keep an eye on my swapfile and drive statistics and CLOCKGS to place a small time and date bar at the bottom of my desktop.

Really useful stuff

PartitionMagic 2.0 is a utility which allows you to organise large hard disks more effectively by partitioning them into

separate logical drives. Most PCs these days are shipped with large drives of 500Mb to 1,200Mb, but on a single FAT partition.

This can be inconvenient and usually leads to a waste of space because large FAT partitions have large cluster sizes (32K on a 1.2Gb partition, for example). As file space is allocated in clusters, the "slack" or unusable space in large clusters quickly accumulates and can amount to hundreds of megabytes on a large partition.

PartitionMagic 2.0 does everything FDISK and FORMAT can do as well as shrink, expand and move partitions. There's a FAT-only version — Partition-Magic for Windows 95 and DOS — and the upmarket PartitionMagic 2.0 for DOS and OS/2, which supports both FAT and HPFS partitions. The program has a graphical interface and is extremely easy to use.

It's particularly useful on systems running DOS/Windows and OS/2 with Dual

Boot or Boot Manager. As you migrate from DOS and Windows programs to OS/2 you can downsize the FAT partition and increase the size of the HPFS partition with PartionMagic 2.0 and you can convert FAT partitions to HPFS, too.

The principle caveat that springs to mind is that, wonderful as it may be, you shouldn't consider using PartitionMagic without first ensuring that any data you can't afford to lose is safely backed up.

Backing up is easy

Recently I've been trying a couple of easy backup utilities. Seagate Backup for OS/2 Warp Personal Edition Version 2 is one of them. In actual fact it's Arcada Backup for OS/2 Warp, which was a Conner product, but will soon turn up in a new wrapper now that Seagate and Conner have merged. Arcada, acquired by Conner a while back, also has backup software for DOS, Windows and NetWare.

Seagate Backup for OS/2 Warp Personal Edition backs up to QIC-80 and QIC3010/3020 drives attached to floppy drive and parallel ports and high-speed QIC tape controllers. So far, it seems to work OK and does have the useful feature of allowing you to restore an OS/2 system from a set of three emergency diskettes, rather than having to completely reinstall OS/2 before being able to run the restore program.

IBM also has a basic QIC tape backup product, which has a similar emergency restore facility. IBM DualStor Backup for OS/2 is more fully-featured than Seagate Personal Edition in terms of its file selection handling and it can backup NetWare bindery files, which Seagate doesn't support.

Both Seagate and IBM's backup products include a scheduler which supports automatic, unattended, backup. For SCSI tape support there is a professional edition from Seagate and Personally Safe'n Sound from IBM. ■

Sequence of events

Descriptive Number Sequences, presented by **Mike Mudge**.

THIS APPARENTLY NEW AND certainly fascinating topic has been suggested by Jonathan Ayres of Leeds. The sequences are denoted by $ds_n(m)$ where n is the index of the sequence and m is the original number. There is a simplified version of the GLEICHNISZHLEN-RIEHE sequence with the property that the next number in the sequence describes the number of each digit in the previous number.

So, taking the case of ds(0) in *Fig 1*.

Fig 1

Gleichniszhlen-Riehe sequence for ds(0)

```
ds₁(0) = 10        (1 zero in previous number, 1 is the digit
                   number and 0 is the occurrence number)
ds₂(0) = 1011      (1 zero and 1 one in previous number)
ds₃(0) = 1031      (1 zero and 3 ones in previous number)
ds₄(0) = 102113    (NB. Because there are no twos in previous number the 0
                   twos are not listed, so ds₄(0)=102113 instead of 10210213.
                   (I will deal with this case later.)
ds₅(0) = 10311213
ds₆(0) = 10411223
ds₇(0) = 1031221314
ds₈(0) = 1041222314
ds₉(0) = 1031321324
ds₁₀(0) = 1031223314
ds₁₁(0) = 1031223314, and so on
```

After ds11(0) all further numbers in the sequence are equal to 1031223314. This is a *self-descriptive number*, i.e. it describes itself. For example, 1031223314 is composed of 1 zero, 3 ones, 2 twos, 3 threes and 1 four = 1031223314.

From my investigations the self-descriptive numbers are:
22
10311233
21322314, 21322315, 21322316, 21322317, 21322318, 21322319
31123314, 31123315, 31123316, 31123317, 31123318, 31123319 *
1031223314, 1031223315, 1031223316, 1031223317, 1031223318, 1031223319 *
3122331415, 3122331416, 3122331417, 3122331418, 3122331419 *

The asterisked lines are related families because the final 1n is not important as n is not involved with the rest of the number.

This leads to my first question:
(1) Is this an exhaustive list of self-descriptive numbers?

Sequences which do not lead to self-descriptive numbers instead lead to *amicable descriptive sequences*. For example, in the case of ds(4), see *Fig 2*.

$ds_{10}(40) = ds_{12}(40)$, so this sequence has entered into a *recurring sequence* of numbers with a *period* of 2, because $ds_n(40) = ds_{n+2}(40)$, n⇒10.
104122232415 and 103142132415

Fig 2

Amicable descriptive sequences for ds(40)

```
ds₁(40) = 1014
ds₂(40) = 103114
ds₃(40) = 10311214
ds₄(40) = 1041121314
ds₅(40) = 1051121324
ds₆(40) = 104122131415
ds₇(40) = 105122132415
ds₈(40) = 104132131425
ds₉(40) = 104122232415
ds₁₀(40) = 103142132415
ds₁₁(40) = 104122232415
ds₁₂(40) = 103142132415, and so on
```

are known as an amicable descriptive pair of numbers, because
$ds_1(104122232415) = 103142132415$
and $ds_1(103142132415) = 104122232415$

There are also amicable descriptive triplets such as
10414213142516 - 10512213341516 - 10412223142516
which have a period of 3. The amicable descriptive sequences are shown in *Fig 3*.

From this I define ds(x) to be the lowest recurring value of dsn(x), so that ds(x) is either a self-descriptive number or ds(x) is the lowest member of an amicable sequence, i.e. ds(0) = 1031223314.

Fig 3

Amicable descriptive sequences for triplets

Period 2
```
103142132415 - 104122232415

314213241516 - 412223241516,
314213241517 - 412223241517,
314213241518 - 412223241518,
314213241519 - 412223241519

41421314251617 - 51221334151617,
41421314251618 - 51221334151618,
41421314251619 - 51221334151619

1051421314152617 - 1061221324251617,
1051421314152618 - 1061221324251618,
1051421314152619 - 1061221324251619

5142131415261718 - 6122132425161718,
5142131415261719 - 6122132425161719
106142131415162718 -
107122132415261718,
106142131415162719 -
107122132415261719,
614213141516271819 -
712213241526171819,
10714213141516172819 -
10812213241516271819
```
Period 3
```
10414213142516 - 10512213341516 -
10512223142516
10414213142517 - 10512213341517 -
10512223142517
10414213142518 - 10512213341518 -
10512223142518
10414213142519 - 10512213341519 -
10512223142519
41421314251617 - 51221334151617 -
5122231425161618
41421314251618 - 51221334151618 -
5122231425161619
41421314251619 - 51221334151619 -
5122231425161619
```

(2) Is this a complete list of the amicable descriptive sequences?
(3) Are there any of higher period?

Any investigations of these three questions may be sent to Mike Mudge, 22 Gors Fach, Pwll-Trap, St. Clears, Carmarthenshire SA334 AQ, tel 01994 231121, to arrive by 1st September 1996. All material received will be judged using suitable subjective criteria and a prize will be awarded to the "best" response arriving by the closing date. ◻

Stepping up to CD

Roger Gann takes you through the basics of installing a CD-ROM drive.

A CD-ROM is no longer a luxury, only needed to play exotic and resource-hungry games. With today's large applications and even larger operating systems, it's easy to argue that it's now a necessity: who wants to install something that comes on 30 floppy disks?

So this month I'll show you how to fit a complementary peripheral: a CD-ROM drive. More and more software is being supplied, as standard, on CD-ROM. Corel-Draw 6.0, for example, comes on four CD-ROM discs.

It's quite possible to justify investing in an inexpensive CD-ROM drive for the sole purpose of installing software. As little as £50 will buy you a quad-speed IDE drive, so they've never been more affordable. Besides, you need something on which to play our brilliant cover disks!

Step-by-Step

HOW TO INSTALL A CD-ROM DRIVE

As with fitting a sound card, installing a CD-ROM entails fitting the drive then installing the software drivers.

Hardware installation

Step 1
● As ever, take the usual safety precautions before opening up your PC — gather together all the relevant instructions and installation disks, together with all the tools you need.
● Power down the PC, remove the casing lid, and enter within.

Step 2
● Now's the time to configure the CD-ROM drive, if it needs it.
● If it's being connected to a (primary) IDE interface then it most probably doesn't require configuring at all: most will work just fine with their default settings, which is usually "slave".
● However, if you're installing it on the secondary IDE channel, then set it to "Master".
● As far as a SCSI drive is concerned, check to make sure that its SCSI ID is unique and doesn't clash with any other SCSI devices installed.
● If it's the "last" device in the chain you may have to "terminate" the connection (and "un-terminate" the previous device).

Step 3
● Check out the drive fixings and the place where it's going to fit — you'll need a free 5.25in drive bay for the new drive.
● If possible, try not to mount it in the lowest drive bay, as the disk tray or caddie could foul your keyboard. Mounting it high also makes it easier to get at the disk eject button with the tray open.
● If it's an IDE/ATAPI drive try to keep it close to the IDE hard disk, as IDE ribbon cables tend to be short.
● Make sure you have the right mounting hardware, too: things like bolts or rails.
● Insert the drive into the drive bay and make sure it doesn't foul anything else.
● Tighten the mounting bolts but don't over-tighten them.

Step 4
● With the driver installed in its bay, attach a spare power cable and the 40-way ribbon cable to it. Some connectors

The front panel of a CD-ROM
1 Loading bay/access door   **2** Headphone jack   **3** Volume control
4 Status indicator   **5** Play Next Track button   **6** Stop/Open/Close button

Step 4
Here, the cable's red stripe indicates alignment with pin 1

The rear panel of a CD-ROM drive
1 Digital output connector
2 CD/Audio connector
3 Master/slave configuration jumper
4 Interface connector
5 Power connector
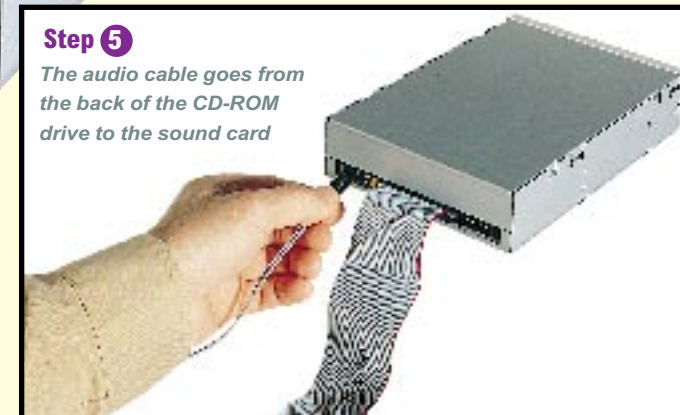
Step 5
The audio cable goes from the back of the CD-ROM drive to the sound card

are "polarised" with a little notch and can't therefore be fitted the wrong way round, but if yours isn't, make sure the coloured (red or blue) stripe on the ribbon cable goes to Pin 1 of the connector on the drive (normally the side next to the power connector).
● If you're lucky, the pins will be numbered. Likewise, make sure it is correctly orientated at the interface-card end. If you're connecting to a SCSI card, you'll have a similar but wider (50-way) ribbon cable.

Step 5
● If you have a sound card, don't forget to connect the audio cable. This is a thin, flexible cable that plugs into the back of the CD-ROM drive and into the sound card. While it's not necessary to have this cable to be able to play sound from a video or game, it will be necessary if you want to play an audio CD through your setup.

Step 6
● Power up the PC. The POST diagnostics won't report anything new, but if you've fitted a SCSI CD-ROM, the SCSI BIOS will recognise the new addition and list it, along with all the other SCSI devices. Either way, you don't have to make any alterations to your CMOS setup.
● The drive's activity LED should flash, signifying the drive is receiving power.

Software installation

With the hardware installation complete, we now have to get the operating system to recognise the new drive and to assign it a drive letter.
● To do this, we need to install driver software, though if you use Windows 95 and don't need to boot in DOS mode, you can rely on Windows 95's own 32-bit internal drivers.
● Your CD-ROM drive will come with a driver disk. This will normally install two files: a driver, specific to that drive, which is loaded in CONFIG.SYS; and a generic DOS CD-ROM Extension, loaded in AUTOEXEC.BAT.
● Because the actual name of the driver will vary from drive to drive, I'll have to generalise.

The line in CONFIG.SYS will look something like this:

`DEVICE=C:\CDROM.SYS /D:MSCD0000`

The "/D:MSCD0000" assigns a system signature to that CD-ROM (you can fit

more than one CD-ROM drive, after all). You can call it whatever you like, but this signature has to be identical to the one specified by MSCDEX (see below).
● If you're running a SCSI system, you'll use a generic CD device driver. If you were using an Adaptec SCSI host adaptor, you'd add a line like this instead:

`DEVICE=C:\ASPICD.SYS /D:MSCD0000`

The line in AUTOEXEC.BAT might look like this:

`MSCDEX /D:MSCD0000 /M:10`

Note the matching "signature", MSCD0000. The "/M:10" switch specifies the number of sector buffers to allocate to the CD-ROM — a crude kind of cacheing.
● There are other switches you might want to use:

/S: Enables sharing of CD-ROM drives on Windows for Workgroups servers.
/L: Specifies the drive letter to assign to the first CD-ROM drive, so using /L:G would assign the drive letter G to the CD-ROM drive.
● Although Windows 95 has its own 32-

Choosing a CD-ROM drive

Apart from your budget, there are three factors you should consider before buying a drive.

1. The first is choice of interface. There are now just two to choose from: either IDE (also known as ATAPI), or SCSI.

Most PCs will already have an IDE interface card, so fitting an IDE will probably be the cheapest and simplest solution. However, if your PC lacks an Enhanced IDE interface, with dual IDE channels, then you really should invest in one — they cost between £20 and £40.

While it's perfectly possible to slave an IDE CD-ROM to an IDE hard disk, it's not really recommended as it can slow down your hard disk. The "lowest common denominator" rule means that with a CD-ROM drive slaved to a hard disk on the same IDE channel, you'll reduce the hard disk's data transfer rate to that of the CD-ROM drive: that is, 600Kb/sec if you've got a quad-speed drive — an IDE hard disk's data transfer rate will normally be at least four or five times this. With a dual channel EIDE interface card you can connect the hard disk to the faster EIDE, or primary channel, and the CD-ROM to the slower IDE, or secondary channel.

For more demanding use, I'd recommend opting for the dearer SCSI alternative. This is because IDE typically uses Programmed I/O to manage the data transfer, which requires a high degree of CPU attention — many so-called "six-speed" drives can only hit their specified

data transfer rate by taking 100 percent of the processor's time, which leaves zero for anything else.

SCSI, on the other hand, offloads the task of supervising the transfer of data from the CPU to the host adaptor and so is very suitable for computer-intensive tasks such as software MPEG decoding. So, if you're going to use your CD-ROM for serious video playback, I'd look at SCSI. Most current CD-R writers are SCSI, which is another reason for picking this interface.

2. The second factor is data transfer rate. Most drives are now either quad-speed (600Kb/sec) or six-speed (900Kb/sec). Older (double-speed) drives are no longer made.

Most CD-ROM multimedia discs are still cut to run on humble double-speed drives, but an increasing number are now being mastered to run on quad-speed drives. The discs therefore won't run well on older drives. So from a multimedia point of view, a quad-speed drive will be adequate for the foreseeable future.

Consider buying a six-speed drive *only* if you need its superior average access speed and data transfer rate for database searching chores, where the extra turn of speed will be noticeable, especially if the drive is shared on a network.

3. The final consideration is a practical one to do with loading — do you want a tray-loader drive or one that requires a disc caddy? It's horses for courses, but I prefer the former simply because it's quicker.

bit protected mode CDFS CD-ROM file system and doesn't need real-mode DOS drivers, it helps to install the older drivers first because the "Add New Hardware" auto-detection wizard will first look at the contents of the startup files before it tries to sniff out the devices.

If it finds a CD-ROM device driver ➡

Explanation of acronyms and terms used

● **Low level**

CPU	Central processing unit.

● **Hard drive and peripheral interface standards**

BIOS	Basic input/output system.
EIDE	Enhanced integrated drive electronics.
IDE	Integrated drive electronics.
SCSI	Small computer system interface.

● **Other terms**

ATAPI	AT Attachment Packet Interface.
CDFS	Compact Disk File System.
CMOS	Complementary metal-oxide semiconductor.
MPEG	Moving Picture Expert Group.
MSCDEX	Microsoft Compact Disk Extension. (A TSR program giving DOS access to CD-ROM drives.)
VCache	Virtual cache.
Wizard	A Microsoft term describing online help which guides you through tasks on the fly.

there, it knows one should be physically present. In actual fact, Windows 95 can only specifically detect the older types of CD-ROM drives that used proprietary interfaces, such as Mitsumi or Panasonic.
● When it comes to IDE and SCSI CD-ROM drives, they will automatically be installed in the same manner as would an IDE or SCSI hard disk. This will occur as long as the interface card is properly installed.

Cacheing CD-ROM drives

CD-ROM drives are relatively slow devices, but their performance can be enhanced by cacheing.

Ever since MSDOS 6.2, SmartDrive has been able to cache CD-ROM drives. To do this, just make sure that MSCDEX is loaded prior to SmartDrive. Windows 95 uses a 32-bit development of SmartDrive, VCache, which ought to be adjusted to suit

Fig 1 *Once you have installed your CD-ROM in Windows 95, check to see that its settings are correct*
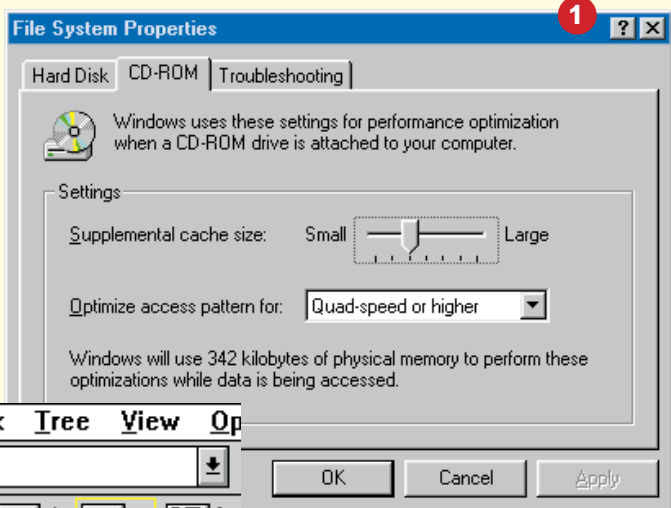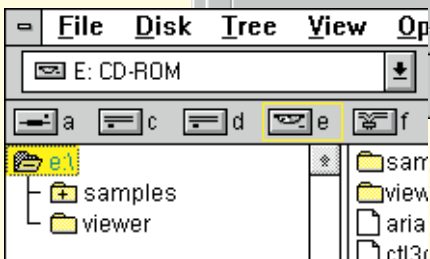
Fig 2 *If all has gone well, then the Windows 3.1 file manager should have an extra drive icon*
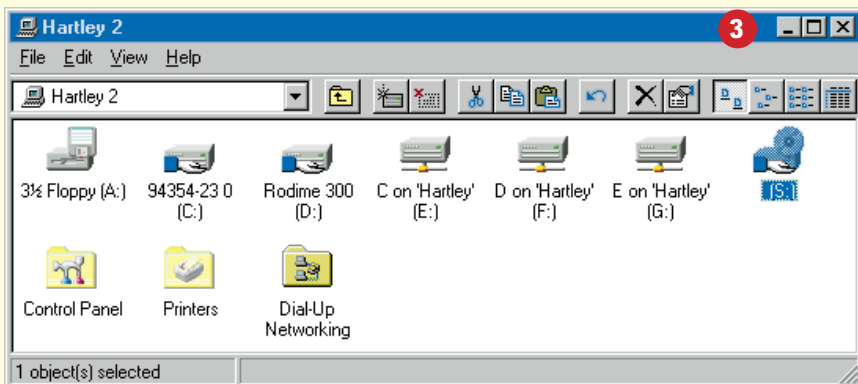
Fig 3 *If all has gone okay under Windows 95, the presence of your new CD-ROM drive will be denoted by a new icon in the "My Computer" group*

On the **face** of it

If your hardware won't allow you to create complex modelling, one way is to focus on textures in 2D. Paint packages can help, says Benjamin Woolley.

IT MAY SEEM A PERVERSE CLAIM, BUT one of the most important pieces of software any 3D computer graphics artist needs is a 2D graphics package, particularly on a PC rather than a workstation. This is because 3D graphics running on a PC will only work comfortably if you are using relatively simple models.

By relatively simple, I mean scenes comprising perhaps 10 or 20 reasonably complex models. On a 16Mb Pentium system, for example, a furnished room with a few chairs, a table, some pictures and the odd piece of bric-a-brac will start to cause some serious disk thrashing and sluggish response times.

The secret's in the textures

The answer to this problem is either to upgrade your machine to a workstation-class system (dream on), or to use simpler models more ingeniously (cheaper and more rewarding). The latter is done by concentrating your efforts less on models and more on the textures that you are going to drape over their surfaces. This is the reason for focusing on 2D graphics.

When an object is rendered, there are several features of its appearance that you can manipulate. For example, take a rectangular block, one of the simplest possible 3D objects that you can create. You can simply give it a colour, which will produce a rather dull picture of a coloured block. However, you can also apply a "texture map" to it, an image (or indeed, an animation or video sequence) which is painted over the image. This image can be applied once across the length of one side of the block, or "tiled" several times over its length. Thus you could put a photograph of someone on the face of the block to turn it into a rather chunky picture (or, if the image is an animation or video, the block could become a TV set). Or you could apply a picture of a brick and tile it over the rectangle to create a brick wall. All of this will have been done using the

same, simple object.

You can get more ambitious and apply a bump map as well as a texture map. Bump maps use the level of light of each individual pixel in the map image to determine how much the surface of the object sticks out. For example, you could give the brick wall a rough surface by applying a speckly image to it as a bump map. The bright speckles will produce bumps, the dark specks, pits. The higher the contrast level of the bump map image, the rougher the surface will look when the model is rendered.

All the 3D packages I have encountered come with a supply of images to use as texture and bump maps, normally stored on CD-ROM. They are generally delivered in standard image file formats, so they can be edited using a standard paint program. It is exploiting this capability that is, I think, the key to successful 3D work on a PC.

Turning professional

There are several paint programs available, many of them good. You even get one free with Windows, which is perfectly adequate for simple tasks. However, for really successful work, it is worth investing in one of the more professional packages.

The CorelDraw suite is probably the best known. It is cheap and quite powerful. I have been a user for some years (drawn by the price), but find the software lacks polish. Even with version 4 I was still encountering bugs, so I never bothered to upgrade to 5 or 6. Perhaps they are better.

Two alternatives I have been trying recently are the latest versions of Adobe Photoshop (3.0.5, which runs very nicely under Windows 95) and Fractal Design Painter (version 4). *Fig 1* shows the texture and bump maps created for a curtain using Photoshop. The curtain is used in a structure being developed for my "Memory Palace" project (*Fig 2*).

Creating these textures took a lot of effort, but I think it was worthwhile. First, I needed a picture of an ornamental star. I
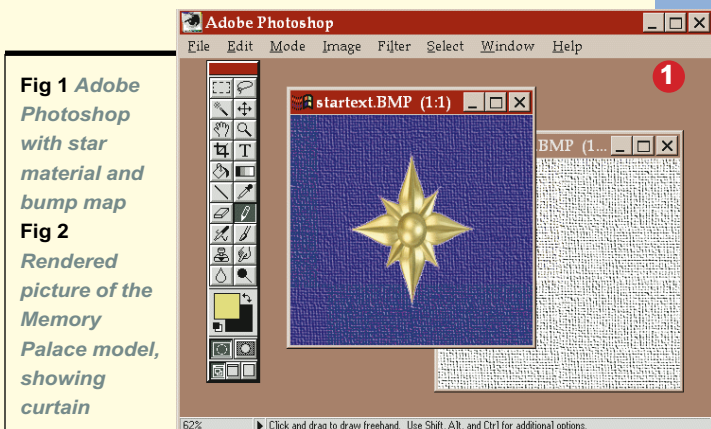
Fig 1 *Adobe Photoshop with star material and bump map*

Fig 2 *Rendered picture of the Memory Palace model, showing curtain*

3D packages: the art of seduction

People get very attached to their 3D packages. This is natural, as they have to spend so much time getting to know them. I apparently upset some veteran users of Newtek's Lightwave with my remarks about the package in the April column, so I have decided to try it out over the coming weeks. But I know already that after the first few hours I am likely to be seduced. Familiarity breeds devotion in this business.

I have found this to be particularly true with the 32-bit Windows packages Truespace (from Caligari) and Extreme 3D (from Macromedia). My loyalties have been flipping between these two ever since I started using them, and I still do not know which I favour (so, in true liberal fashion, I suppose I shall have to say I favour both).

Truespace has been around on the PC platform for longer (it is now in version 2) and its relative maturity shows. Extreme 3D, which is brand new, crashed a couple of times on my Compaq, though fortunately with frequent saving I managed not to lose anything vital. It also lacks support for all but one or two 3D and 2D file formats. Among other things, this effectively prevented me from using the Alpha channel in the creation of the curtain fabric (the Alpha channel is used to determine the transparency of each pixel in an image, so can be used to layer textures over the top of each other).

Such a serious omission is surprising in a package that is in other respects so well specified. Its texture-handling capabilities are extensive. There is network rendering (over mixed Mac and PC networks). It provides excellent realtime sketch rendering (just about the best in the business, I would say). It also offers full Bezier spline-based modelling, which is wonderful to use. The Bezier bit means you can edit curves with great precision and ease using "control handles".

Truespace also has splines,

but it is in many other respects more basic than Extreme 3D, and this is reflected in the price. On the street it is well under £400 (at the time of going to press, Extreme 3D had a recommended retail price of £525). The documentation, in particular, is on the sparse side. However, simplicity has its merits. Truespace has most of what you need while remaining simple and straightforward. The most important tools are there, and all are a joy to use: intuitive, nicely organised, easy to access. Truespace also supports a vast array of file formats and makes a pretty good fist of translating them into its own.

Whichever is the better, both demonstrate at least one thing that relates to the first half of this month's column: the demands that 3D makes on the system. You cannot realistically run either package on a system with less than 16Mb. A Pentium is essential, as is a 24-bit graphics card and either a gigabyte of disk space or a removable disk (not for the programs, but for the vast array of files you will generate using them).

On my 16Mb 60MHz Pentium, state of the art just a year or so ago, the KISS principle applies whatever software I use: Keep It Simple, Stupid.
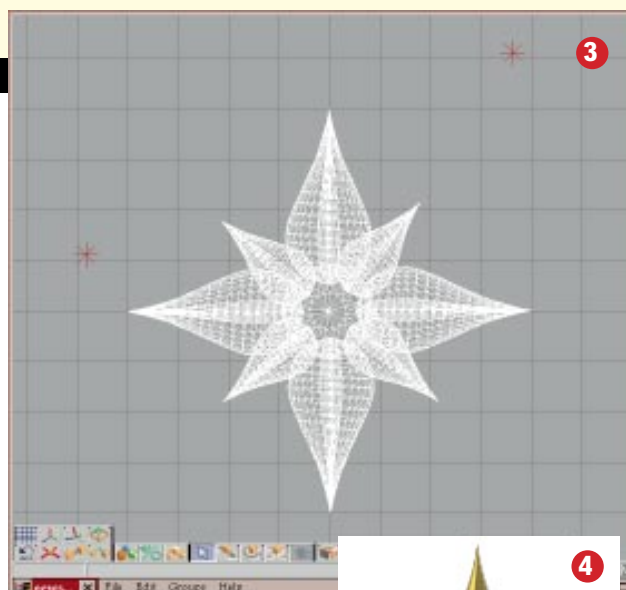
Fig 3 *Star model, displayed using Truespace 2 and ready for rendering*

Fig 4 *Rendered image of the star model*

applied and sketch-rendered using Extreme 3D (of which more, left).

Photoshop is excellent for editing and manipulating existing images. If you can't afford it, PaintShop Pro version 3, which is distributed as shareware, is a good substitute. To create images from scratch, however, it is also worth considering Fractal Design's new Painter 4, whch seems to be particularly good at creating various architectural effects such as mosaics and " tessellations" (good for stained glass). I'm still experimenting, but I have found it enormous fun. One critiscism: some bright spark thought it would be entertaining to package the CD and manuals in a paint tin. This gives you a moment's amusement when you open it up, and hours of frustration as you try to fit everything back in again.

Fig 5 *Extreme 3D, showing curtain with material applied. The grid next to it is the working plane used to draw profiles for 3D models*

decided to model one from scratch (*Fig 3*) and render the picture from that (*Fig 4*). I imported the picture into Photoshop and created a background of plain blue, which I gave a fabric texture using one of the plug-ins that are used to apply effects to images. This one was available from Adobe's new Gallery Effects range. I used the same

Gallery Effect to create a fabric bump map (the underlapping window in *Fig 1*). This is in mono, because the size of bumps is determined by the brightness of each pixel rather than its colour (helps keep the size of the file down, which helps reduce rendering times later). You can see the preliminary results of using this material in *Fig 5*,

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Thumbs up for **thumbnails**

You know those nice graphics file icons on the Mac? Now you can get them under Windows 95. Hooray! says Gordon Laing.

Before concluding last month's topic of making selections, here's the latest news in the world of graphics and DTP. Unbelievably, in the same month, here are solutions to perhaps the two most infuriating problems I've had in recent days — apart from my troublesome water boiler, of course.

Thumbnail icons

For years I've been banging on about how fantastic the Macintosh platform is, particularly when it comes to graphics. But it takes two to tango. Apple has done a certain amount of work with its Macintosh operating system, but as much, or even more, has been achieved by the application and utility developers.

Adobe wrote an incredibly useful piece of code into Photoshop for Macintosh, which created thumbnails of graphic files and used them as the icons for the files themselves.

When searching through windows full of graphics files, there's no longer any confusion in identifying them. The thumbnails may be small, but it's remarkable how easily you can spot the desired file at a glance. This was such a useful facility that virtually all Mac graphics apps offered the same, leading many to believe that the code was part of the Mac OS itself.

Great; but where does that leave us Windows users? Well, according to Microsoft and other developers, it leaves us up DOS creek without a resource fork to paddle. For it is the Mac file system with

its resource forks which allows cunning developers to attach handy extras such as thumbnail previews.

Cunning plans, clever tricks

Fortunately, there's cunning and there's *real* cunning: winner of this month's really cunning plan is Inset, developer of the fluent graphics converter, HiJaak.

The latest version, HiJaak 95, now acquired by Quarterdeck and reviewed in this month's *First Impressions* section, does what we had virtually given up hope of: thumbnails for graphics files icons under Windows 95.

I believed this to be so improbable that in January's column I even mocked up a fake screenshot of what I desired — and that's not just an excuse for you to peruse my infamous Christmas card design once more. The screen you see before you today is not a fake — it is the real thing, and has absolutely made my day.
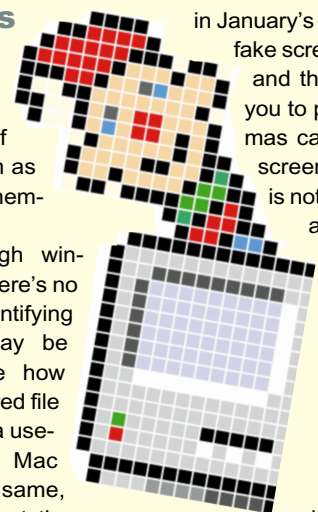
Post-installation, HiJaak 95 sets to work creating thumbnails for your existing files, then waits in the background for any newcomers to turn up.

Full details, along with its other facilities, are described in the *First Impressions* review, but here are a couple of additional points.

HiJaak is not infallible. It did a good job recognising most EPS and TIFF formats, but failed on some of the more obscure flavours, such as Lab TIFFs. It didn't crash, fortunately, but instead created false-coloured or white boxes as preview thumbnails. In some cases there were a few dots or squiggles but all were sadly meaningless. To put this into perspective, these were mostly odd types of EPSs, and generally those created by CorelDraw, whose file filters I don't entirely trust.

One other slight concern crops up thanks to HiJaak's cunning cataloging system, which allows searches to be made on key words you've attached to properties of files.

The problem occurs when you've got more than one file of the same name in different locations. HiJaak assumes

they're identical on the basis of name and extension alone and uses the same thumbnail for all of them.

This cropped up when HiJaak was creating thumbnails on my disk and came across the results for last year's *PCW* scanner group test. I had five different sets of results for each scanner, separated into five folders.

Due to my choice of naming, I had five epson.tifs, agfa.tifs and hp.tifs. HiJaak created thumbnails for the first folder, then reused them for the other four folders. Unfortunately, when I updated the thumbnails for the second folder, HiJaak used these for the other folders as well.

A little annoying, but forgivable, and I thank the programmers at Inset for at last writing *the* Windows 95 utility for which I've been waiting. For those too engrossed to check out the review in *First Impressions*, HiJaak 95 costs £49.95.

Ra-ra-ResEdit

A couple of months ago several graphics journalists, including myself, were invited to an Adobe press briefing where it was hinted that Illustrator for Windows 95 would be discussed. Perhaps unsurprisingly, this was not the case, and what was hoped would be a revealing morning turned out to be a big misunderstanding.

Rather than let it go to waste, and spotting Photoshop developer Doug Olson as one of our hosts, I tentatively turned the morning around into a full-blown technical support session. Not much fun for everyone else in the room, but I finally got the answers I was looking for.

The story starts a few weeks ago on Adobe's appallingly slow Web site, where I had spent hours downloading the update from Photoshop 3.0.4 to 3.0.5 for Macintosh. Why? Well, it didn't offer any big changes, but I had hoped it would fix a bug which reared its ugly head when I previously upgraded from 3.0 to 3.0.4.

Photoshop is an undeniably sophisticated application. One of the things we at *PCW* use it for most is converting hundreds of PC screenshots saved in a huge variety of colour depths, resolutions and formats, into standard Macintosh CMYK TIFFs, ready for the repro house.

It's really handy selecting a whole window full of DOS files, dragging them on to the Photoshop for Macintosh icon which darkens to

Selections made with vector paths. From bottom, the Parrot selected by dropping plenty of points joined by straight lines, and its palette. Next, the Orange, selected more carefully with fewer points and a curved path; see palette directly below
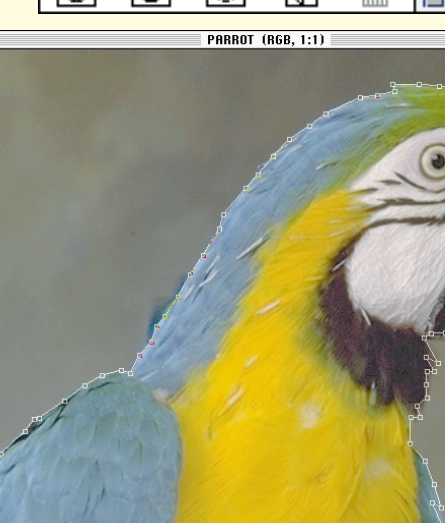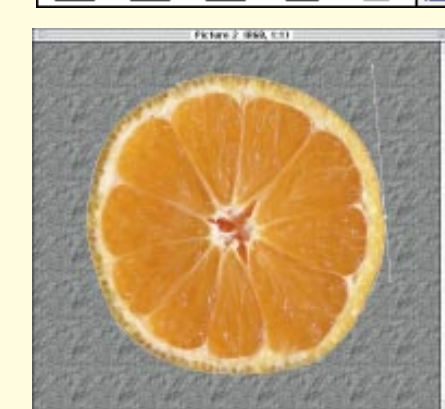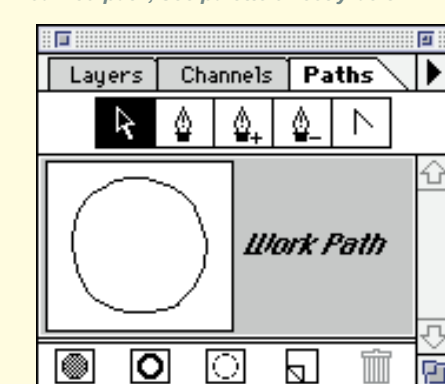
indicate recognition, then automatically launches and opens every one of them without ever having to go to File-Open. Until 3.0.4 that is, which resolutely failed to darken with DOS files and would only play ball with Mac files. Much to my disappointment, 3.0.5 failed to fix this.

However, after much discussion with Doug and several emails, I had my solution. Like all the best computer fixes it's not pretty, and it requires some deft handling with ResEdit, the third party Macintosh file resource editor. Anyone interested in the details and a fascinating insight into how the Mac operates at a low-ish level, should check out Chris Cain's Macintosh column on (page 326).

The good news is that Adobe is now aware of the problem and is currently shipping fixed versions. The bad news is that there's still no sign of Illustrator for Windows, nor the fabulous Adobe Dimensions which, to be fair to Adobe, ties in closely with Illustrator.

Some more good news, though, is the announcement of Fractal Designs' Poser and even Macromedia Fontographer 4.1 for Windows, to be reviewed as soon as I get my hands on them. Spookily, I had wished for both of these in the same "Dear Santa…" column (January issue) as the thumbnail icons for Windows plea. If I didn't know better, I'd think someone was looking out for me. Peace, goodwill and serious font handling for Windows must be just around the corner.

Paths to success

Last month's Graphics & DTP described how to make a variety of selections in bitmapped photo-retouching packages such as Photoshop. The point about this is that any manipulations occur only to selected areas of the image, allowing you to leave other parts untouched. Rather than change the entire colour of an image, you could, for instance, select the sky and alter this alone, without touching any other part of the image.

All the techniques explained last month work with pixels on the bitmapped image itself. Selections made in this manner, either by hand, marquee or magic wand, can be extended but not reshaped by dragging the outline. You have the dotted outline of a selection that may just be a tad off in places, but rather than tugging at corners, you have to change the tolerances and start again. At best you
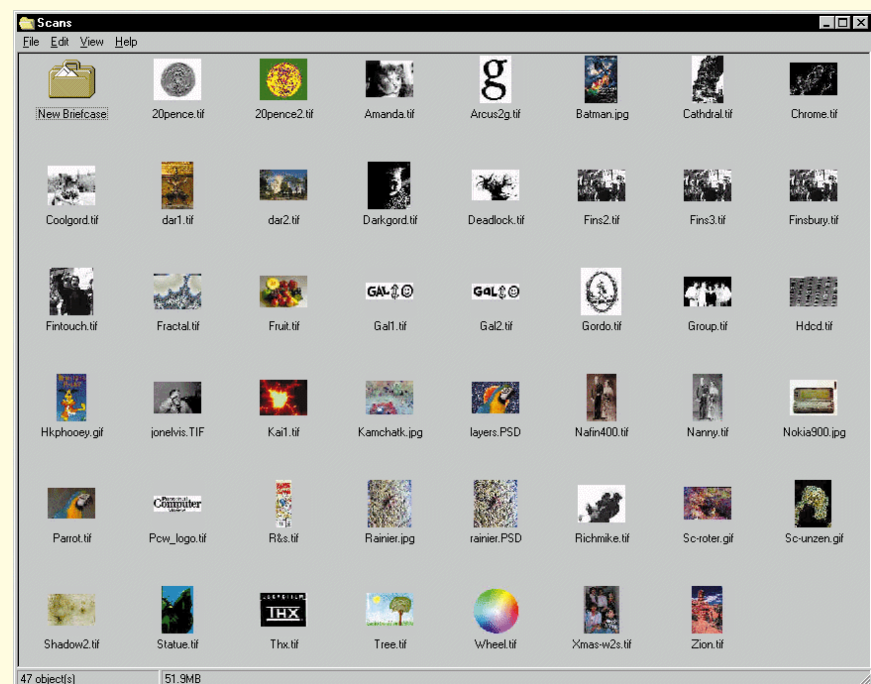
can add or subtract tiny portions of similar colours, but it's still infuriating.

One method would be to use the flexibility of vector outlines, which may be dragged about, reshaped and resized without any loss of resolution. Fortunately, many high-end packages offer this facility, in the form of Paths.

Paths are as easy to use as the description above. Simply choose the path tool, the pen icon in Photoshop, and draw a shape as you would in any drawing package such as CorelDraw, Freehand or Illustrator. Vector drawing consists of dropping points, which are joined up by the application.

After the initial shape has been drawn, each point may be dragged in any direction desired. Handles may be extracted from a point which adjusts the curviness and direction of the path as it passes through that point. Paths are fully described in the manuals for these applications, and were covered in detail in this column, *PCW* April '95.

The real beauty of paths is not just the fact that they're totally editable, but that they can be saved for future use. Being vector descriptions they're small, too. Selections, complex ones in particular, can take quite a while to create, so it's a real boon being able to save a path in case of a crash or other emergency. You can, of course, close down the application and reload the selection for additional work at a later date. Some applications such as Photoshop even allow you to convert conventional selections into fully editable and saveable paths.

Making selections of straight-edged shapes is a doddle with paths. Just drop a point at each corner and let the application join them up with perfectly straight lines. Even though it's possible to adjust paths so that they match curves perfectly, you can still get great results just by dropping lots of points around the shape. They may be joined by straight lines, but they could be fine enough not to show.

Which leads us neatly on to the conclusion. Much of the time you'll be making selections to cut out and paste somewhere else. If you are pasting on to a new background, the hard edges of your selection make it stick out like a sore thumb. Two options to soften the blow are anti-aliasing and feathering.

Anti-aliasing surrounds the object with pixels of intermediate background and foreground shade. The result is a softer edge which blends in much better.

Feathering blurs the edges of a selection. The user defines the number of pixels the blurring should extend in to, and out of, the selection. Blurring too much loses detail but can be used for neat effects such as the white glow around my portrait in the "never-a-month-goes-by-without-a-mention" Christmas card.

Font of the Month

What a beautiful typeface: FB Elli of the Font Bureau collection *(pictured above)*, available from FontWorks, is just begging to be used in a cookery book or on a menu. Houghton Library commissioned calligrapher Jean Evans to design the typeface, which was presented to famed librarian Eleanor Garvey upon her retire-
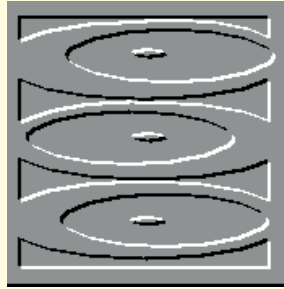
It's quicker by **bus**

Panicos Georghiades and **Gabriel Jacobs** flag down the miroVideo DC20, a card which uses the PCI bus to speed video capture. Plus, the new IconAuthor for Win95 and the Net.

I N A PREVIOUS *HANDS ON*, WE stressed that to get good results with digital video it's important to initially capture and work with (edit) video containing as much information as possible — in other words, with very low compression. The final result then needs to be at the higher compression ratio required for distribution.

The bottleneck for capturing video at low compression is usually the hard disk transfer rate. Hard disks have been getting better at this, but the problem with many of the cards designed for amateur use has been the transfer rate between the card and the computer. This problem has been addressed by the use of the PCI bus and from now on you'll see many video capture cards using it (most of the cards on the market still use the ISA bus).

The price is right
The miroVideo DC20 is one of the first of these new PCI cards. It's medium-sized and can capture up to 3.5Mb of data to the hard disk (whereas last year's model, the DC10 using the ISA bus, managed just over 2Mb/sec). 3.5Mb/sec is not really state-of-the-art specification — remember, there are cards out there for professional "broadcast use" — but it is state of the art for a price of just over £700. Not bad.

For a full PAL signal (both fields of 25fps at a resolution of 768 x 576 this works out at a ratio of about 7:1, while for a quarter-screen resolution of 384 x 288 (good enough for MPEG-1) it works out at a compression ratio of about 2:1. The compression method is, of course, M-JPEG (Motion JPEG) and the chip it uses is a Zoran (as with other cards from Fast, Reveal and Spea). In this case, it's the ZR36050.

The card digitises at 4:2:2 YUV (YUV is a luminance and chrominance colour-encoding scheme for natural pictures). This

Above *Here, for your multimedia D-light, is IconAuthor, a graphics-based authoring package*
Right *The miroVideo DC20: the quality of its digitised images is impressive, given its modest price*

gives 24-bit colour (as with other cards) when grabbing moving video, but it's also capable of 32-bit colour still-image capture — as are some of the latest flatbed image scanners. It accepts S-Video as well as composite signals (all three TV signal standards: PAL, NTSC and SECAM are supported).

The miroVideo DC20 also includes a video output (S-Video and Composite), and if your hard disk can handle the 3.5Mb/sec transfer rate and capture 736 x 576 at the lowest compression ratio, you can end up with video which is better than S-VHS (Hi-8)

quality. So you can use this card to edit video on a hard disk and output back to tape.

Getting the measure of it
The bundled software includes Adobe Premiere 4.0 LE, Adobe Photoshop LE image processor, Asymetrix 3D F/X, and Vidcap32. There's also a utility program that measures the data transfer rate of

your hard drive, as well as the transfer rate of the PCI bus to memory, since you can also capture directly to memory (as long as you have masses of it).

The card can capture at 16:9 (so-called widescreen). Many films are transmitted using this format nowadays, and you can even buy special TV sets equipped for it. Additionally, you have the normal 4:3 screen ratio.

Before capturing, you can alter the brightness, contrast, saturation, hue, video filter, compression rate

and hard-disk data rate settings.

The card is plug & play and is compatible with graphics cards up to 1,600 x 1,280. There's no feature connection required, and the installation is software based — no jumpers or dip switches to set. However, you do require a Pentium 90 or better, 8Mb RAM or more and a
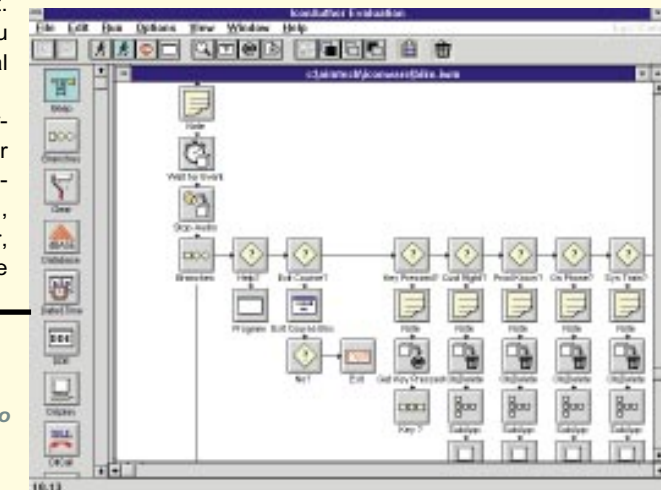
With IconAuthor, tools are dragged from a palette onto a flow diagram

Held captive by the video question

Over the last six months, about a third of the letters we've received have been about video capture cards and MPEG video playback. It seems that either the interest in this topic is increasing dramatically, or else there isn't enough information available out there. Probably both.

Anyway, we'll bring you as much new information as we can about these topics, as and when we have it. So among this month's goodies, we've tested a new video capture board and bring you the results. Here's a typical email on the subject:

● "Why is it so hard to find out about video capture boards? I want to buy a PC and edit video with it. It's as though companies like miro and Fast are trying to avoid me. Desktop Video companies are trying to sell me configurations I don't need. To whom do I turn?"
fin3bni@arts-01.novell.leeds.ac.uk
You are most welcome to turn to us with specific questions, after you've done your own research: see our review of the new miro board, on the first page of this feature.

● "I am writing to comment on the advice given to James Purbrick (*Questions & Answers, February*) regarding the question of whether or not to purchase a multimedia docking station. I was wondering if you might be able to put me in touch with Mr Purbrick, because as fellow TI TM4000M owners we may be able to benefit from each other's experiences.

His suggestion of an external enclosure with CD-ROM drive and SCSI disk was the path I took. This was mainly because, for £399, all I got was a two-drive enclosure, stereo speaker pair, double-speed CD-ROM drive and a 3.5in drive bay — not very good value, even at the street price of £300, and after having reclaimed VAT. The TM4000M has a powerful power amp on the output jack and is quite loud with unpowered speakers.

The docking station is really a drive enclosure with speakers built in. However, I solved the problem of requiring active termination by using a CD-ROM drive with internal termination (which can be disabled). The TM4000M has a Fast SCSI-2 port micro-D50 pin. Cables cost a bomb. Termination costs even more."
Jason Tay <100256.3556@compuserve.com>

We sympathise wholeheartedly with the prices of cables using the micro-D50 SCSI connectors; some suppliers charge over £50 for such cables, which is daylight robbery. We're told that only Adaptec makes that type of connector, but we don't believe it. As your letter has appeared here, Mr Purbrick may get in touch with you, but we cannot pass on readers' addresses without their permission.

3 1 0
PERSONAL COMPUTER WORLD
JUNE 1996

3 1 1
PERSONAL COMPUTER WORLD
JUNE 1996

300Mb hard disk or larger.

Thanks to drivers specially adapted for Adobe Premiere, the producers claim ten times faster display of images in the editing window and computation of motion JPEG files twice as fast. We tested the card on a 133MHz Pentium, which is fast anyway, but were still impressed.

An interesting upgrade option for the card is the miro Mouse, an accessory used to control camcorders and video recorders via control buttons and a jog shuttle. It supports VITC, RCTC and RAPID time codes. This can speed things tremendously when digitising video clips.

Our verdict? The quality of the digitised images is the best we've seen to date for a card costing less than £2,000. For the price, it's probably the best card on the market today.

IconAuthor 7.0

Aimtech's Icon-Author, together with Macromedia Authorware Professional, have been top-of-the-range multimedia authoring packages for a number of different platforms.

They're both expensive, both target the CBT market, and both use similar graphical methods for constructing multimedia applications — tools are dragged from a palette onto a flow diagram. This, it is claimed, eliminates the need for programming, and makes the packages easy to use even by "ordinary" people. Not that experienced multimedia developers aren't ordinary people, of course, but this is how both companies justify the high price of the products. They claim that the pay-off comes in time saved by easy development by non-experienced users. You now have the chance to see for yourselves whether this claim is true by having a go yourselves, using the demo on this month's cover-mounted *PCW* CD-ROM.

With this new version IconAuthor is now one step ahead of the competition, and takes on board two main contempo-

The really wild cycle show, courtesy of IconAuthor

rary issues: Windows 95 and the Internet. Version 7.0 is 32-bit, so you can experience the better performance offered by Windows 95 (you can also have the long file-names: what a relief to be able to say to Mac users, "Yes, we have that too").

IconAuthor and the Internet

It's also "Internet compatible". But what does this mean? Well, it goes beyond HTML Web pages. New features enable you to create pull-down menus and include drag and drop, timers and combo boxes in your Internet applications.

Perhaps the most important of these Internet-related features is one called Universal Media Access (UMA). It allows you to create applications, parts of which reside on the Internet and parts on CD-ROM or a Local Area Network (LAN). That way, you can put on to the Internet those parts which need to be constantly updated, while keeping back others which need less frequent updating and/or which can't be delivered properly via the Internet due to the low transfer rates of modems. Remember that a 14,400 baud modem (admittedly, without on-the-fly compression) is about 90 times slower than a single-speed CD-ROM drive.

With UMA you can update Internet pages with ease. What's more, you can enter a URL (essentially, an Internet

Wild Planet Cycles

Customer Satisfaction

The Customer
Product Knowledge
On the Phone
System Training
Exit Course

It is suggested you study the topics in the order listed. Select your choice to continue.

F1=Help   Credits

address) as a path in your path file. Thus you can create your files locally (graphic or otherwise) and store them on your Internet site. When IconAuthor has to access these files, you simply change the name of the path variable.

Present tense

You also get IconAuthor Present, a free run-time player which can be set as a helper application in a Web browser (such as Netscape) to launch an IconAuthor application from within a Web page. Aimtech states that it will be announcing specific support for the Netscape API in the future.

Other new features include an image manipulation utility (ImageLab), a palette object for handling palette shifts, a table object to handle the display of spreadsheet and database-type data, zooming graphics, and a search-and-replace facility.

IconAuthor claims the largest degree of platform portability, including Windows 3.x, 95, NT, OS/2, Unix/Motif and the Mac. One small disappointment at present is that Java isn't supported, but Aimtech tells us it's considering this at a later date.
● The demo on the *PCW* CD-ROM enables you to save but not distribute applications, and you're limited to 100 icons. Because each icon in the flowchart carries out a specific action, the creation of multimedia applications using this demo can be no longer that 100 actions, but you'll find that's quite a lot.   ■

[Untitled]

http://www.aimtech.com/images

@_ANIMATE_PATH=c:\ia61\ANIMATE
@_AUDIO_PATH=c:\ia61\AUDIO
@_DATA_PATH=c:\ia61\DATABASE
@_FORMAT_PATH=c:\ia61\FORMAT
@_GRAPHIC_PATH=http://www.aimtech.com/images
@_ICONWARE_PATH=c:\ia61\ICONWARE
@_INPUT_PATH=c:\ia61\INPUT
@_LIB_PATH=c:\ia61\LIBRARY
@_MOVIE_PATH=c:\ia61\MOVIE
@_TEXT_PATH=c:\ia61\TEXT
@_USER_PATH=c:\ia61\USER
@_VARIABLE_PATH=c:\ia61\VARIABLE
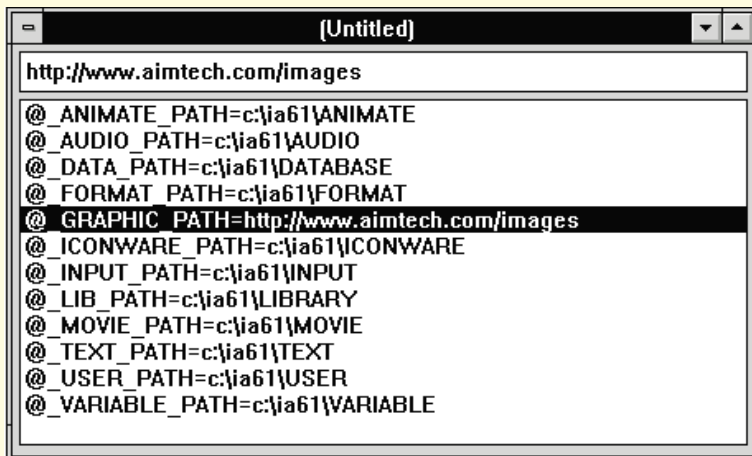
The path variables for an application. The graphic path variable is set to a URL

PCW Contacts

If you have any multimedia-related problems or queries, email us at **g.c.jacobs@swansea.ac.uk**. We're sorry, but we can't answer queries by personal reply — we'd be at it all day! But we're glad to publish queries, with our answers, which we think will interest *PCW* readers generally.
Aimtech 0171 702 1575
miro Computer Products (UK) 01494 510250

Maxing your **MIDI**

Don't put up with moaning MIDIs. **Steven Helstrip** shows you how to get more from your music machine.

I T'S ABOUT TIME WE took a closer look at getting more out of your setup. So, here I've selected some sound Helstrip tricks to help you squeeze more from your MIDI.

● Less noise from your PC

Noise is a problem within every MIDI/audio setup, whether it's a standalone PC with a sound card, or a more complex studio setup. The first thing to do is to ensure that your sound card is fitted in to a slot as far away as possible from other cards: graphics cards and other intensive processors create the most audible interference. While you do this, position the card as far away as possible from the PC's power supply.

Using high-quality shielded cables between your sound card and mixer, or amplifier, reduces noise and considerably improves sound quality. The mini stereo-jack-to-phonos cable supplied with sound cards are often poor quality. For around £3 you can buy a solid mini stereo-jack-to-two-phonos converter, which will convert your card's output to phono plugs, allowing you to invest in decent cables. You can buy the converter from Tandy.

Most sound cards have individual amplifiers for each component (WaveTable synth, CD-audio, mic and line inputs), adding to the noise problem. Muting those not being used helps considerably.

AWE-32 owners should permanently mute the microphone input and use the line input to record, since the mic input is particularly noisy. Setting the master volume
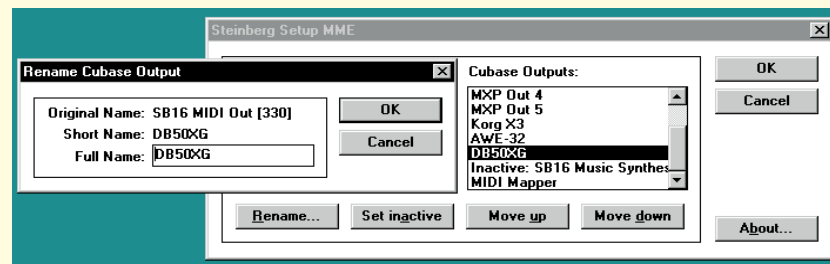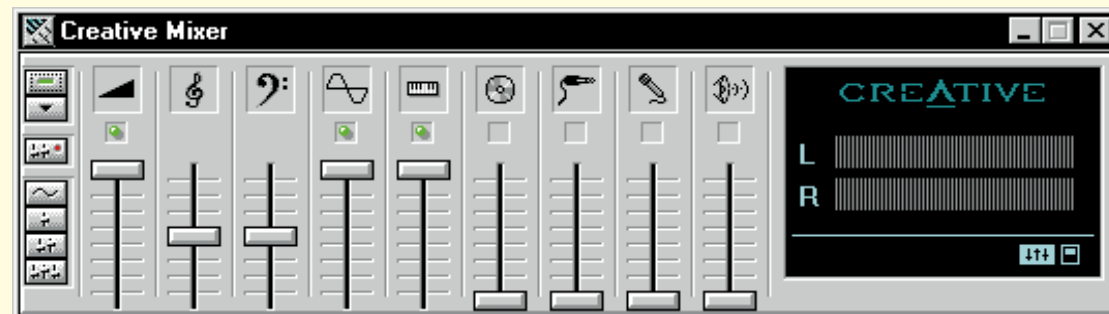
Top Muting the Mic and Line inputs can help reduce noise from your sound card

Above Give your sound card a recognisable name from the MME setup in Cubase

to maximum will improve the signal-to-noise ratio. If there is any distortion, reduce the gain settings on your mixer channels.

● Friendly MIDI ports

If you use Cubase and have several MIDI ports, you can rename them in the Setup MME drivers application. So, for example, instead of selecting SB16 MIDI Out (330) you can give it the name of the instrument connected to it. In my case, this is Yamaha's DB50XG daughterboard.

● Saving AWE-32 sessions

When I last counted, I had nearly 2,000 sample banks (SBKs) for the AWE-32. Remembering which ones I have used in a

particular song, and their locations, was just about impossible, since no application exists that allows you to save entire sessions. Nevertheless, I have come up with a solution. When you load a sound bank, an entry is made in the user bank section of SBWIN.ini, noting its filename and path. Having completed a song, you can copy the ini file (located in the Windows directory) and paste its contents to the notepad within your sequencer. Returning to that song later will enable you to quickly reload any samples you have used.

The Sbwin.ini file provides you with a reference to all the samples you've used on a particular song
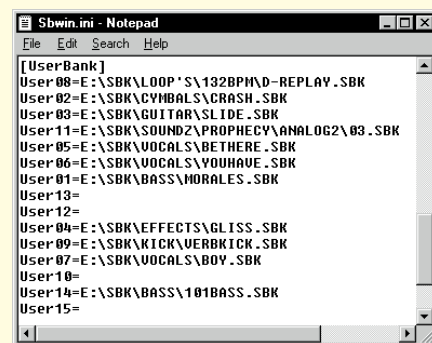
Let's face the D-Zone and dance

T he people at D-Zone have been knocking out sampling CDs at quite a rate over the past few months. DanceZone is the latest product and one of its best so far — assuming dance-orientated CDs are your cup of tea. As usual with the Loopisms series, you get 25 pre-looped loops (if you see what I mean), and a load of "one-shot" samples. This time, the samples are courtesy of the Korg Prophecy and all are recorded at middle C. There are 125 samples in total, ranging from analogue sequences to slap bass timbres.

From now on, all of D-Zone's CDs, including this one, will be mixed mode, which means all the samples will be provided in audio and Windows .wav format. On the CD-ROM partition you will also find each sample in SBK format ready to be downloaded to the AWE-32 sound card — a nice touch.

The loops are predominantly house/garage orientated, although there are several jungle-esque loops to be found. Inclusion of the loop from Todd Terry's mix of Everything But The Girl's "Missing" (one of the best-selling singles, ever) was a bit cheeky, I thought — you couldn't possibly use it and get away with it!

For just £12.95, this is another "must have" for your collection. Owners of AWE-32 cards shouldn't hesitate. There's even a playable demo of Rise of the Triads on the CD for when you need a break, and a demo of Cool, the Windows sound editor.

● Loopism's DanceZone is distributed by Time + Space (see "Contacts", page 317)

● Save time with templates

How many times have you recorded a "four on the floor" kick drum pattern? And how many times have you tapped in 16s on the hi-hats? Because most sequences start life with a rhythm track, why not create a folder for frequently used sequences?

The tracks can be saved as complete arrangements (kick, snare, hi-hats, tambourine) or, for more flexibility, as individual parts which can be imported into any sequence. You can customise templates to name tracks, or set up drum maps, to free up more time for you to be creative.

● Change for the better

If your MIDI setup is limited to a 16-part multitimbral synth such as a sound card, it doesn't mean you are limited to using just 16 instruments within a song. By using program change messages, you can alter sounds during a sequence.

For instance, if on channel 1 you have a violin that plays only at the start of the track, you can switch to any other instrument once it has stopped playing by inserting a program change message.

Bear in mind, though, that most synthesisers take a fraction of a second to

Cubase Scores under Windows 95

H ere's news of an update for Cubase Score 2.0*. Anybody running version 2.0 under Windows 95 will have experienced several problems, the most annoying of which is that the activity display doesn't work. This has now been fixed, and there are several new features — one of which is a new "virtual" MIDI port which allows you to output via the Windows MIDI mapper.

Most of the problems associated with printing and editing scores have been eliminated, and there's improved text handling. Keyboard commands which make use of the Alt Gr key proved to be a problem for many users since not all keyboards have the key. This can now be simulated using Control and Alt.

* The current version is 2.03. Updates can be obtained from Harman Audio (see page 317).

Chord of the Month

This month's mega-chord is G minor with a ninth. The notes in the chord are:
G, B flat, D, F and A — the ninth gives the chord a jazz flavour.

change sounds. Any program change messages should therefore be made, say, a whole bar before the new instrument is required to play, to avoid any glitches.

● Mapping events

Panning an instrument, or effect, within a song can give a track greater stereo presence. However, inserting pan messages (continuous controller no10) is time con-

copies to transmit on a separate channel. Subtly panning the individual instruments will create a wide sound.

● Creating chorus effects

Playing two identical parts on the same MIDI channel causes a flanging, or chorus, effect. You can alter the effect by changing the velocities of each part.

● Create delays

If you don't have delay, or echo, built in to your synthesiser, you can create your own by copying parts to several other tracks. By offsetting the copied tracks, a delay effect is created. Delayed tracks can be reduced in volume or velocity and panned to create stereo effects.

● Storing cue points locator positions in Cubase

You can store cue points in Cubase in two ways: as song position, and as left and right locator positions. To store your current song position (for example, the start of a chorus), hold shift and press 0-9. To recall cue points,
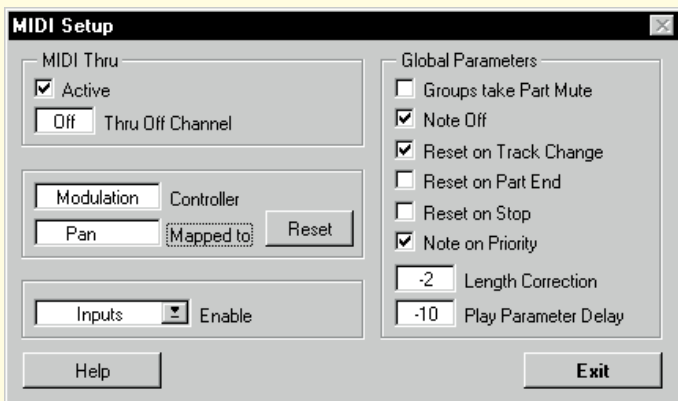
Mapping controllers in Cubase can save you hours of inputting CCs manually

suming and incredibly dull. Mapping a controller, such as modulation, to pan or other CC will allow you to record data in real time from your MIDI keyboard. In Cubase this can be done from the MIDI setup dialogue box. Going back to templates, you can save tracks or parts containing just the pan information for later use in other tracks.

● Massive string pads

By layering sounds you can create a bigger sound. Layering works particularly well with strings and pianos, although you can experiment with other timbres.

There are two ways to layer sounds. The first is to set several instruments to receive on the same MIDI channel when connected to the same MIDI port. If channels are fixed, as they are on sound cards, you can alternatively copy whole tracks within your sequencer and set the "ghost"

simply press the location at which it was stored.

The same procedure is used to store locator positions, only these are saved and recalled using function keys. If a part is highlighted in the arrange window, pressing Alt Gr (or Control and Alt) and P will position the left and right locators around it. ■

PCW Contacts

Readers' contributions to the Sound column are music to our ears. If you have any hints or tips, any MIDI-related items or general comments, send them in to the usual *PCW* address, or to **steven_helstrip@pcw.ccmail. compuserve.com**

Harman Audio (Cubase updates)
0181 207 5050
Time + Space (DanceZone)
01442 870681

Ooh, you **Saxy thang!**

Build point-and-click access into your applications with Sax Webster, says Tim Anderson. There's widgets and Windows, too.

FORGET LAPTOPS AND MOBILE phones; the fashion accessory of the moment must be the personal Web site. Web sites are of no use unless they are visited, so why not build point-and-click access into the applications you distribute?

You can do this by calling an external application like Netscape or Internet Explorer, but Sax Software lets you go one better by building a customised browser right into the application.

The Webster control is a 32-bit browser OCX that drops directly into any compatible development tool, such as Visual Basic 4.0 or Visual C++ 4.0. With the rampant growth of the Internet and increasing corporate usage of Intranet networks, Sax Webster has turned up at just the right moment.

For example, online help might now mean dynamic information on a Web site, rather than the static file shipped with an application. Another option is to direct the hapless user to a site offering further products and services. HTML pages can be loaded from disk as well as from the Internet, so you could also use Webster as a multimedia browser.

Sax Webster is a complete application wrapped in a control. You can create a browser simply by dropping the Webster control onto a form in VB or Delphi. It claims to support HTML version 3.0, but Sax notes that "because 3.0 is not yet defined as a standard, it may differ from what Netscape, or some other 3.0 browser, supports."

Here is the problem with Webster, and ultimately with the Web itself: lack of tightly defined standards resulting in compatibility problems. It may not matter too much, since it would be foolish to use a Webster application as a replacement for Netscape or Internet Explorer. Webster makes better sense as a tool for accessing specific Web sites that are linked to the container application, so you can ensure the compatibility of those particular pages.

Some problems can also be overcome by writing code to intercept Webster events: for example, Webster does not support the mailto command that HTML uses to initiate an email message. The VB 4.0 code in *Fig 1* will intercept mailto and call whatever application is associated with that command in the Windows 95 registry.

Another useful feature is the GetContent method, which lets you read all or part of an HTML page into a variable.

Initially only available as a 32-bit OCX, Sax has now released a 16-bit OCX as well, but nothing yet for VB 3.0 or Delphi 1.0 diehards.

New-look Data Widgets
Sheridan's Data Widgets has long been one of the most popular Visual Basic add-ons, particularly since the VB 3.0 grid is so poor. The data-bound controls in VB 4.0 are better but still leave room for third-party enhancements. Version 2.0 brings the expected conversion to 16- and 32-bit OCX format, but with enhancements. Sheridan has taken the opportunity to restructure the Data Widgets using objects and collections, bringing it into line with other programmable OLE objects. This makes for more logical code and increases the programmer's control, the disadvantage being that code which worked with Data Widgets 1.0 will have to be extensively rewritten (*Fig 2*).

The actual Data Widgets controls are the same six as before: Data Grid, Data Combo, Data Dropdown, Data OptionSet, Data Command and the Enhanced Data Control. All are useful, but the Data Grid is the reason people buy this package. Its neatest trick is to link with a Data Drop-Down so that users can click on a grid cell and select values from a dropdown list bound to a field in another table.
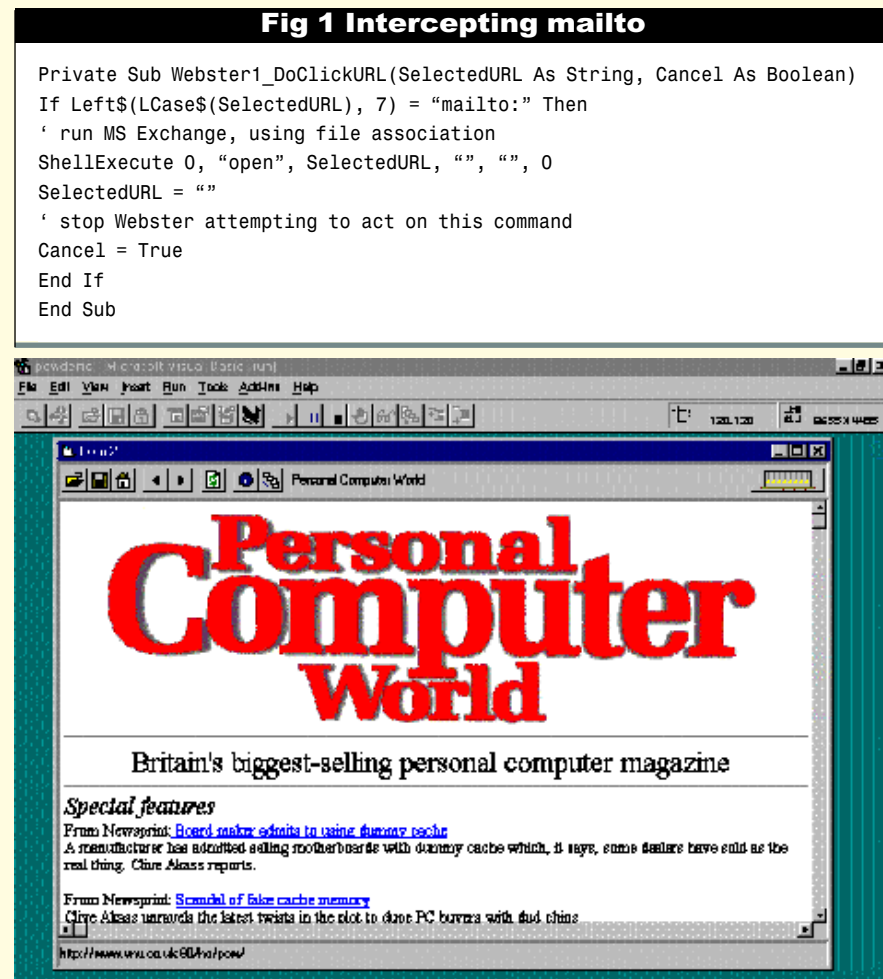
Do you need Data Widgets? It depends on how you prefer to program. If you make extensive use of bound controls this bundle is all but indispensable, particularly if a data grid is a key part of the user interface. The data control in VB 4.0 is not compromised in the same way as VB 3.0's effort, so this is a perfectly sound approach. The cautionary note is that large OCX controls like these cause substantially slower loading of your VB application, and grids are often not the best way to present data to the user. The Data Grid also works well as an unbound virtual list control — a further enticement which may sway doubters.

Tools of the trade
Microhelp's OLE tools may have up-to-date OCX technology, yet the package conveys a dated impression: the main reason being that apart from their OCX conversion, many of the controls are little changed from earlier versions, right down to their description in the manual and the clunky example applications. OLE tools also slipped up during review when one of the genuinely new items, MhSubClass, failed to deliver. This is a message-trapping control that can catch Windows API messages and either kill them, or respond with a custom event and pass them on.

MhSubClass is fine for some purposes; for example, if you want to inspect WM_MENUSELECT messages in order to provide a help text as the mouse runs down a menu. But a common requirement is to trap a message and then write code to determine whether to kill it or pass it on. MhSubClass cannot do this, since the fate of the message has to be determined before the VB event is triggered. Rivals such as the Message-Blaster OCX have no such handicap.

Never mind the quality — with 54 separate controls, the bundle still rates as good value. MhCalendar is a data-aware

---

Fig 1 Intercepting mailto

```
Private Sub Webster1_DoClickURL(SelectedURL As String, Cancel As Boolean)
If Left$(LCase$(SelectedURL), 7) = "mailto:" Then
' run MS Exchange, using file association
ShellExecute 0, "open", SelectedURL, "", "", 0
SelectedURL = ""
' stop Webster attempting to act on this command
Cancel = True
End If
End Sub
```

All done with Webster: VB 4.0 visits the PCW home page

Fig 2 On the button

To put a button in a DataGrid cell in version 1.0 of Data Widgets, use a ColBtn property:
```
SSDbGrid1.ColBtn(2) = True
```
which in Version 2.0 becomes
```
SSDbGrid1.Columns(2).Style = 1 ' edit button
```

Top Tips: slim, dim and begin

● Speed VB's load time and slim your applications by stripping down AUTOLOAD.MAK (VB3) or AUTO32LD.VBP (VB4) to include only controls and references essential to every project.
● Avoid "Dim iA, iB as Integer". This code declares iA as a variant. Instead, use "Dim 1A as Integer, IB as Integer".
● In VB4, disable Compile on Demand (in Tools - Options - Advanced) to have the compiler check for syntax errors before a project runs.
● Your Delphi application can easily check for command-line parameters. ParamCount returns the number of parameters; ParamStr(0) returns the path and filename of the application; and ParamStr(n) returns the nth parameter up to ParamCount. For example:
```
procedure TForm1.Button1Click(Sender: TObject);
var
i: integer;

begin
for i := 0 to ParamCount do
  MessageDlg(ParamStr(i), mtInformation,
   [mbOk], 0);
end;
```
● If you are adding lines to a string control like a listbox or memo, or an outline component, use BeginUpdate to increase performance by preventing screen updates. For example,
```
procedure TForm1.Button2Click(Sender: TObject);

begin
listbox1.items.beginupdate;
listbox1.items.add('One item');
listbox1.items.add('another item');
listbox1.items.endupdate;
end;
```

Fig 3 A little application to toggle with

Here are two functions to detect the status of the screensaver and to check its state. Note that to work in Windows 3.1, the declarations will need to be adapted.

```
Option Explicit
Declare Function SystemParametersInfo Lib "user32" Alias ➜
"SystemParametersInfoA" (ByVal uAction As Long, ➜
ByVal uParam As Long, lpvParam As Long, ByVal fuWinIni As Long) As Long
Public Const SPI_GETSCREENSAVEACTIVE = 16
Public Const SPI_SETSCREENSAVEACTIVE = 17


Function isActive() As Boolean
Dim lRetVal As Long
Dim pvParam As Long


lRetVal = SystemParametersInfo (SPI_GETSCREENSAVEACTIVE, 0, pvParam, 0)
If lRetVal = False Then
MsgBox "Call to SystemParametersInfo failed"
isActive = False
Exit Function
End If
If pvParam = False Then
isActive = False
Else
isActive = True
End If
End Function


Sub SetActive(bActive As Boolean)
Dim lRetVal As Long
Dim pvParam As Long
lRetVal = SystemParametersInfo ➜
(SPI_SETSCREENSAVEACTIVE, bActive, ByVal pvParam, 0)
If lRetVal = False Then
MsgBox "Call to SystemParametersInfo failed"
End If
End Sub
```

(Note: ➜ this symbol has been used where the code shown on the following line is a continuation, and should be entered as such. You'll find the complete code on this month's cover-mounted CD-ROM, together with versions for VB3 and Delphi).

The MhSplitter control from OLE Tools attempting resolution independence. Unfortunately, this text box does not always get correctly resized

Screensaver settings: hacking into the Win95 API

"I've bought a new system with Windows 95 and VB 4.0. My computer has a WIn/TV card, and I wanted to write a program that would turn the screensaver off and on without having to go into the display properties tab.

How or where can I find out about the API calls necessary to change the screensaver settings? Is there a book which describes all the Win32 (and/or Win16) API calls?"

Mark Horton

Windows 3.1 introduced a handy function called SystemParametersInfo. This reads or sets numerous system parameters including the screensaver settings.

Fig 3 shows a small VB application for Windows 95 which toggles the screensaver on and off. The two key functions, IsActive and SetActive, work by calling SystemParametersInfo. The application checks the current state of the screensaver on loading, so that it can be restored on exit.

Another possibility is for your application to disable the screensaver whenever it has the focus. Windows activates the screensaver by sending a WM_SYSCOMMAND message with wParam set to SC_SCREENSAVE. By intercepting and killing this message, you prevent the screensaver from kicking in. Delphi programmers can trap messages easily but VB users will need an add-on like the MessageBlaster OCX.

Many problems such as this can only be solved using the Windows API. That, in turn, means having a good API reference and the starting point is the Windows SDK help file called WIN31WH.HLP for Windows 3.1, and WIN32.HLP for 32-bit Windows. Surprisingly, Visual Basic 4.0 comes with declarations for the 32-bit API but not the 20Mb help file.

An alternative is Daniel Appleman's book, *VB Programmer's Guide to the Windows API*, which provides what's needed for Windows 3.1 and is to be updated for Win32. ◼
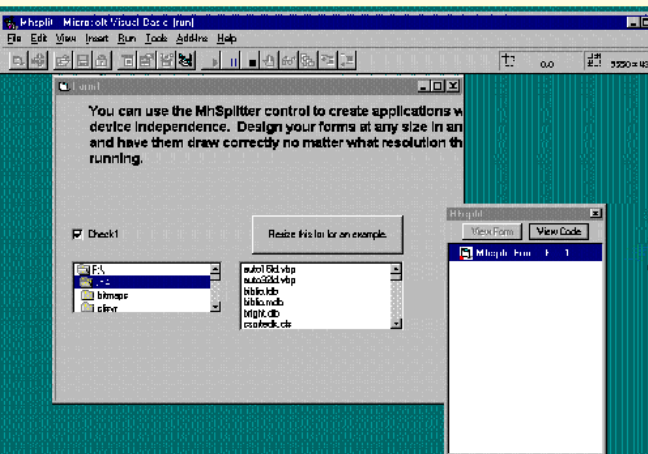
calendar control. MhSplitter allows you to build resolution-independence into interfaces by automatically resizing controls within the container, albeit rather slowly. MhRealInput is a text box that improves on VB's masked edit control for working with real or currency values. And so it goes on, providing something of value for most VB projects.

Microhelp supplies two versions of these tools: OLE tools has 16- and 32-bit OCXs, while VB tools stays with the old VBX format. There are differences between the two. For example, the inadequate MhSubClass is OCX-only, while the clever MhOutOfBounds universal data binding control is VBX-only.

Finally, VB tools used to come with a version of Farpoint's Grid control, but that has now been dropped.

The great **bathtub curve** mystery

A bad case of "stiction" nearly got the better of Stephen Rodda. This is how he restored order…

Hard disks have only a limited life, you know. Mine did. Or, rather died. It must be about time for me to have what seems like my annual rant about backups and so on, so consider yourselves ranted at. I had a case of "stiction" (a combination of friction and sticking), characterised by the drive not spinning up when power is applied. Luckily it was under warranty (a DEC OEM warranty of five years) and was replaced next day.

Bathtub blues
Unluckily, the replacement suffered from bathtub curve failure. A bathtub curve is the shape of a bath cut down the long way, half-way between the taps. You start at the tap end and graph failure of new units in pieces per thousand or so against time. At the tap end, fairly many new units will fail. As the faulty ones die, there's a fairly level area from the plughole up to where the bath starts sloping at the other end. This is where the equipment fails due to wear and old age.

No sooner had the engineer gone (around ten o'clock in the morning) and I had started to format the replacement, than I heard some funny noises coming from the disk. I wandered over to my Frankenstein machine which was formatting it, and received the dreaded Adaptec error screen, telling me the disk had failed. I switched the machine off and tried again.
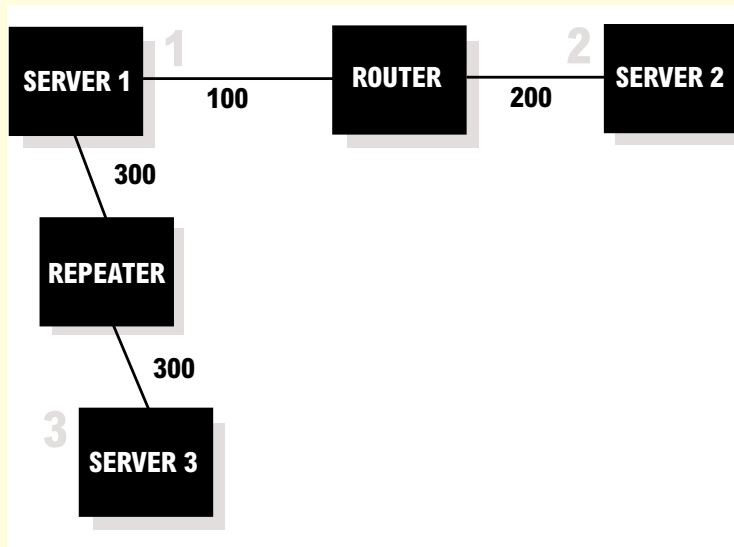
Fig 1 *How to stop servers complaining about the network numbers of the other servers [see "We've got your number"]*

This time it was better. The disk not only refused to come online, but after a while it powered down. I telephoned DEC again, telling them the disk had died. "There's nothing we can do about it today," they said. "We do warranty repairs with a day's turnaround." "But this was reported yesterday," I howled over the telephone. "No, the report you made yesterday has been dealt with." "By giving me a drive which died within ten minutes." "Possibly so, sir."

The moral of this story is that tomorrow I shall nail the DEC engineer down and force-feed her or him with coffee until the drive has finished formatting and verifying.

Luckily I only had stiction, and I could just do a couple of extra backups to make

quite sure. Remember — there's no such thing as too many backups. Of course, all the live data was on the NetWare server, mainly because I'm too lazy to move it, so the NT Server and Linux machine is the one that's out of commission. Actually, there's a secondary drive in it. Let's see if that's bootable. No it isn't. So, here I am, using an RM EISA machine. It's a piece of luck that there's a spare. I shall tell you what happens to the restoration of the data and the fitting of the new drive in a few lines, and you will be a lot better off than I, since you will know in a few moments. I shall have to wait another 20 hours or so.

Dear diary
Today. The hard disk has been replaced and formatted. Now I'm blessed if I know where I can find drivers for my CD. I suppose even if I found them, I'd have forgotten how to install them. Windows 95 and NT just don't need all this. Oh, I forgot to mention *why* I need drivers for the CD. I need drivers for the CD so that I can install Windows NT so that I can use the backup routine to restore from the tape drive. In the end, I went and stole an Apple CD, stuffed it onto the SCSI interface and ran EZSCSI from Adaptec.

Twenty minutes later, my machine was running Windows NT and restoring data to the new hard disk. Within the hour, I'd rebooted finally and everything had been restored perfectly.

Never mind the internet, here's the intranet

Since the most recent buzzword seems to be "intranet", I thought I'd have a wander along that path.

The first question which posed itself was, "What exactly is an intranet?" I define an intranet as a LAN or a WAN operating under TCP/IP and providing some or all of the facilities available on the Internet itself.

Now, I don't have a lot of use for local FTP since all machines can (sometimes with a little jiggery-pokery) talk to

all other machines on my network. Nor do I find life not worth living without Telnet. Something which seems to be quite useful, however, is a local World Wide Web server (or perhaps I should call it an Office Wide Web). This allows you to test World Wide Web pages without
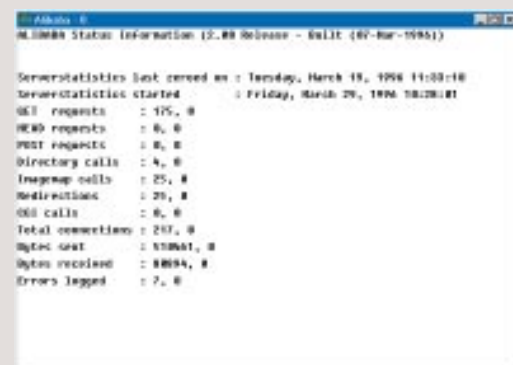
having to go online all the time. Most of the stuff you need from day to day would be available simply with a LAN connection, loading pages manually with File and Open.

Sometimes, however, it's nice to be able to test CGI scripts and image maps without going to the trouble of uploading the pages to a Web site and trying from there. To that end, I have looked at LeanHTTP (a simple server with no scripting abilities) and at Alibaba, which is built for Windows 95 and NT. LeanHTTP, which works well, really just changes your home page to a local version and can't really be recommended for any other reason than it will allow a Macintosh to access HTML files on a Windows 95 machine. Alibaba, however, on ftp://ftp.eunet.co.at/pub/vendor/csm/alibaba/alibaba.exe, is a very different kettle of fish. Be prepared for a 4Mb download. I used an ftp agent to get it, since it was too slow from The Netherlands, so I'm sure it's a reasonably slow site. It's currently running on our LAN and I'll be reporting on how we get on with it in a future column.

Fig 2 *Alibaba's statistics screen*

We've got your number

I am often asked about network numbers under Novell's NetWare, and how to stop servers complaining about the network numbers of the other servers. Remember this simple rule: you can't refer to the same piece of wire carrying the same protocol by different numbers. In this case, "the same piece of wire" includes two segments bridged together or an extended network containing a repeater. *Fig 1* (page 323) may help to explain; for clarity, workstations have been omitted.

Server one has two networks attached to it. Firstly, it has the segment numbered 100, which is connected to a router. This could be any form of router, but let's just say that this is a connection to a kilostream link to an office in another part of the country, which is connected to server 2. Now note that the segment which appears after the router is numbered 200 — that is to say, differently from that which goes into the other end of the router.

Note also that server 1 is connected to a very long LAN which will not reach all the machines on the site. The network administrator has added a network repeater which has extended the effective length. This repeater is transparent to the server and server 3 will see that server 1 is calling the segment by its original number. Installing server 3 we have to be careful to use the same number as server 1 for that segment. If we were to add another LAN segment to server 3, we could not use 100 or 200 again, since these numbers have already been used on the same LAN.

Xen and the art of network upgrading

"For the past year we have run a very small PC network. I asked the local Novell/Apricot dealer to design a suitable network for our purposes. This consisted of:
● *1 x Apricot Xen PC Pentium 75, 8Mb RAM, 1Gb hard disk.*
● *2 x Apricot LS Pro, AMD 486 33MHz, 8Mb RAM, 230Mb hard disk.*
● *1 x HP LaserJet 4MP+ printer.*
● *1 x Epson dot matrix printer.*

The Xen PC is the server, running Net-Ware 3.12 and Tapeware backup. The LS Pros run WfWG 3.11, and on a daily basis use MS Office Pro, PageMaker 5, and Access for Windows accounting.

I have subsequently added an Inter-graph TD4 PC workstation (2 x Pentium 100, 64Mb RAM, OGLZ graphics, 1Gb HD, operating under Windows NT Work-station 3.5). All are connected by 3Com Ethernet boards and coaxial cable.

The Intergraph drives an HP DesignJet 200 plotter, a 4Mb DAT drive via SCSI, and primarily runs Pro-Engineer 3D mod-elling software, MS Office Pro and Page-Maker 5. Occasionally it needs to access the accounting package.

We are effectively networked to share data files and printers. We have no in-house anorak, but most of us have long experience of Windows since version 1.0, a year of NT, and virtually no experience of NetWare.

It is now time to add a couple more workstations to the network (probably LS550s), mainly to use the accounting

package and MS Office. I have been receiving conflicting advice from suppliers, who should know more than we do, but I sometimes wonder. My questions are:
1. With NetWare, I have been told we can-not use the Xen as anything other than a server and for network backup duties. Is this true? It would clearly be helpful to have this machine as another workstation.
2. If we dumped NetWare and plumped for NT Server, what are the pros and cons? If we did, would you recommend Win95 or NT for the workstations?
3. Are there any other cost-effective solu-tions which would make the server avail-able as a workstation?
4. If not, is there any advantage to updat-ing 3.12 to 4.0?
5. Finally, I use a Xen-PCm at home, using most of the software mentioned above, and would like to be able to log on to the network after hours to access the account-ing package and other files. The Xen has 16Mb RAM, a Pentium 120 and 1Gb HD, and runs Windows 3.11.

Which remote control software would you recommend, assuming MS Remote Access could be bettered? Again, should I run NT or Win95?"
Tony Young

Phew! I'll answer the questions in the order you posed them:
1. Firstly, whoever told you that the Xen can only be used as a server was guilty of feeding you utter rubbish. It's a computer, just like anything else (albeit over-speci-fied for running NetWare). I also presume

that whoever sold you a Pentium as a server also specified the machine with an IDE or EIDE hard disk (was that scornful enough, by the way?). Really, it does make me cross that people specify the wrong sort of computer all the time. At least when a parrot is taught to speak, you know that whatever comes out of its beak is not going to be blessed with anything as dangerous as original thought.
2. Since NetWare seems to work in your installation, I wouldn't suggest changing it now. I'm of the "If it ain't broke, don't fix it" school of thought. Windows 95 and Win-dows NT make perfect clients for Net-Ware, so there's really no problem with your current installation. With the current specification of workstation you have, it's difficult to recommend any operating sys-tem other than Windows 3.11. If you were to put another 8 or 16Mb in the worksta-tions, I'd suggest you go for NT Worksta-tion. On these machines, it would be faster than Windows 95.
3. Certainly there are. Just swap hard disks between one of the workstations and the server, and reconfigure (if necessary) — not forgetting to make a note of the settings first, before you open the machines up. You've then got a faster workstation and a server which still goes as fast as before. My NetWare server for four machines is a 386DX-20: you just don't need anything faster if you're only sharing files.

Another possibility is to see if there are any second-hand machines available for use as a server. An old Compaq Deskpro 386 DX with 8Mb of RAM would be ideal, as long as it is capable of taking your exist-ing hard disk. Even if it isn't, hard disks are cheap enough that you could (possibly) upgrade to a SCSI hard disk for the server. (I'll bet these shysters sold you an IDE disk, I really do...)
4. There's no advantage to changing your network operating system until it breaks. One possible cause is that you might exceed the user count. Have you got a five-user installation, and do the printers log on to the network through JetDirect cards? Using one of the printers hanging off one of the workstations frees a Novell seat if things are getting tight.

If they do, and you want to, then I'd sug-gest first that you change your dealer. The one which specified the system for you clearly can't find its corporate bottom with both hands. It would have been better for you to have two faster workstations and a slower server — and they would have made more money.

If you find that you run out of network-ing connections, there are two possible avenues you can explore. The first, and more expensive, would be to upgrade the server to NT Server (or Workstation, since that allows ten connections). Remember, however, you'll need an altogether beefier machine to run it. The other possibility would be to see if you can get another copy of NetWare 3.12 which allows more users if it's necessary, but you should be able to do this by buying from someone who's retiring their old NetWare system.
5. A remote control system isn't the same as a remote client system. I'm not sure whether you're really clear on that point. If you only want to grab a few files for work at home, I don't think there's anything wrong with the MS Remote Access server and client which comes with Windows 95 or NT. Windows for Workgroups 3.11 on your home machine should be able to commu-nicate adequately with one of the machines on the network for file transfer. There's no point in spending money on a flashier product which would only do what you're already capable of doing for free.

If you decide to upgrade your home machine's operating system, do remem-ber that more memory would not go amiss.

Sharing is such sweet sorrow

"I wish to set up two computers to share files between them via a modem link. I have tried to set it up using Dial up Networking in Win-dows 95 but failed miserably. Could you describe how to do it? Otherwise I shall end up having to shell out an enormous £120 for LapLink 95 to do the job.
P.S. Both machines run Windows 95."
Ian Powell

The problem here is that you only get the Remote Access Client with Windows 95. If you need a Remote Access Server, then you need the Plus! Pack. This supplies the Remote Access Server, and your troubles will be over.

324
PERSONAL COMPUTER WORLD
JUNE 1996

325
PERSONAL COMPUTER WORLD
JUNE 1996

A touch of **gold**

Polish up your System 7.5 with the Golden Master version of update 2.0. Chris Cain reviews the new features and improvements.

The rumours were true. As predicted last month, the US Golden Master version of System 7.5 Update 2.0 is available now for download on Apple's Web sites and AOL. When installed, this takes your Mac to System 7.5.3.

Although this is just a maintenance release, it is nevertheless a big one which boasts much-needed improvements and bug fixes to the MacOS — and it's getting a lot of good press coverage in the US. There's more native code for PowerMacs and a faster Finder for everyone. It generally makes the Mac feel more solid than ever before.

I'll go though some of the new features, tell you what they're all about and how they might affect the way you work. I'll also be handing out a few tips on Apple's ResEdit that I picked up recently, along with the latest on news and updates — it's been a busy old month here in the Mac world.

Apple offline

First the news, and perhaps the biggest event this month was the announcement that eWorld, Apple's graphical online service, is no more.

The service has been discontinued and the company is encouraging existing users to turn to AOL and the Internet instead. This move isn't surprising, really, given that eWorld only had around 200,000 subscribers worldwide, and that it was more or less Mac only. But I, for one, will miss those well-designed pages. They looked a lot like the ones on AOL UK, except with more class.

Just as it should, Apple is offering to bounce existing users' email to another address for a period of 90 days. For more information, talk to Apple's Customer Services department.

On a more positive note, QuickTime 2.2 has been announced. This new version will feature a QuickDraw 3D data track and a change to the MIDI side of things that Apple claims will give PowerMac users CD quality General MIDI music in software. It will provide greater control in this area, too, allowing third party developers to create their own instrument file plug-ins.

It's about time this area was addressed: the original idea of a software sound card was great, and the system has the potential to be very flexible. The current samples sound completely flat when compared to their hardware equivalents.

Other QuickTime developments coming down the line include software MPEG playback and a plug-in for Netscape designed to optimise streaming video playback over the Internet. There's also possible support for multimedia scripting languages such as Macromedia's Lingo.

This fits in well with the news that Macromedia has released a version of ShockWave (its technology for playing Director Movies over the Internet) for the Mac. This is certainly an exciting time to be in the Mac multimedia field.

Finally, on the monthly updates front, Connectix has released yet another patch for its popular Speed Doubler utility.

The new version is 1.1.2 and mainly fixes compatibility issues.

System 7.5.3

From around mid-April 1996, any new Mac that you buy will come with System 7.5.3 installed. Existing users can upgrade by installing System 7.5 Update 2.0, or by obtaining a complete copy of the new software. Although everything looks the same as the old 7.5 at first glance, there are some subtle differences and improvements you should know about.

● Monitors and Sound

The Monitors and Sound control panels (or single Sound and Display panel if you have a PCI Mac) have been replaced by a new control panel which is not really a control panel at all: it's an application. But either way, it's now the main method by which to switch graphic resolutions, colour depths and deal with the audio ins and outs on your Mac.
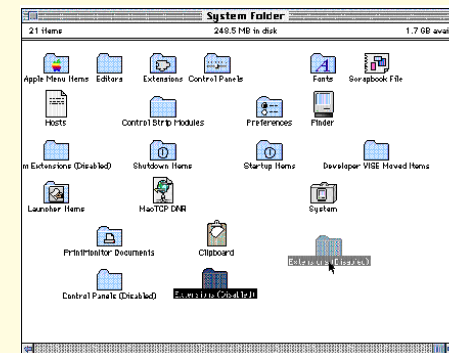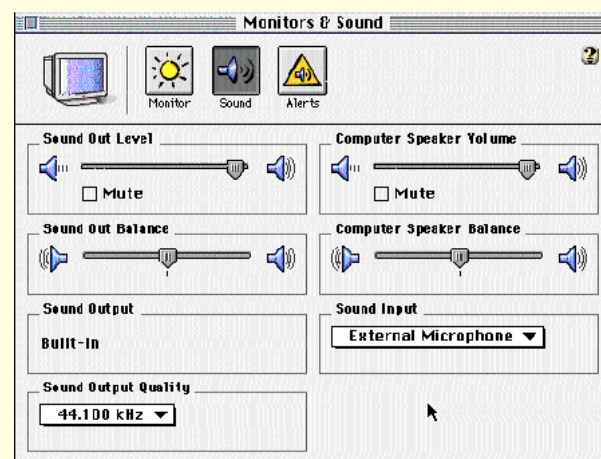
● Translucent dragging (PowerMac only)

When you drag an icon around the Mac screen, you normally get its outline displayed under the mouse pointer. In 7.5.3 you get a more stylish "translucent" image, as seen on systems like Windows 95. If you drag more than one icon, only the image directly underneath the cursor is displayed.

● Open Transport 1.1

The Open Transport 1.1 networking architecture now works on 68030 and 68040 models as well as PowerMacs. It boasts a few more options, supports PC Card interface cards and NuBus as well as the PCI bus, and has several bug fixes which should please anyone currently experiencing troubles.

● Control Strip

Originally designed for Powerbooks and installed only on PCI desktop models, the Control Strip is now standard operating equipment.

It enables users to quickly set the sound volume, switch screen resolutions and bit depths, and turn file sharing and AppleTalk on and off. Third party modules for the panel can be added by dropping them into the System Folder.

● Desktop Printing

Another extra that originally came with QuickDraw GX, desktop printing gives you icons for your printers, on screen.

Now you can print a document by simply dragging it on to the icon for the printer you want to use. If it's an application-specific file, such as a Word document, the Mac will launch the package, evoke the printing facilities, and quit the application — handy.
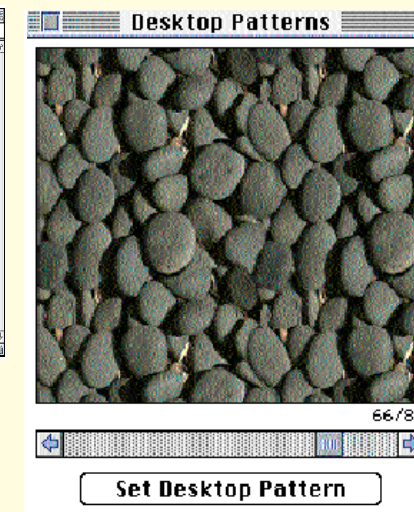
● Desktop Patterns

Yes, there are some new desktop patterns. These aren't particularly important but they are something that everyone uses, and the more you've got to choose from the better. There are ten new ones, and the roses are my favourite.

● Desktop Rebuilds

The final user-noticeable change is that program comments in Get Info windows no longer delete when you rebuild the desktop. Perhaps this will encourage more people to use this facility?

Fig 1 Adjusting preferences in Aaron

1. Make a duplicate copy of Aaron and open it using ResEdit. When the main window appears, find the resource called WPrf and double-click on the icon. Another window will appear with a couple of numbers in it. Double-click these
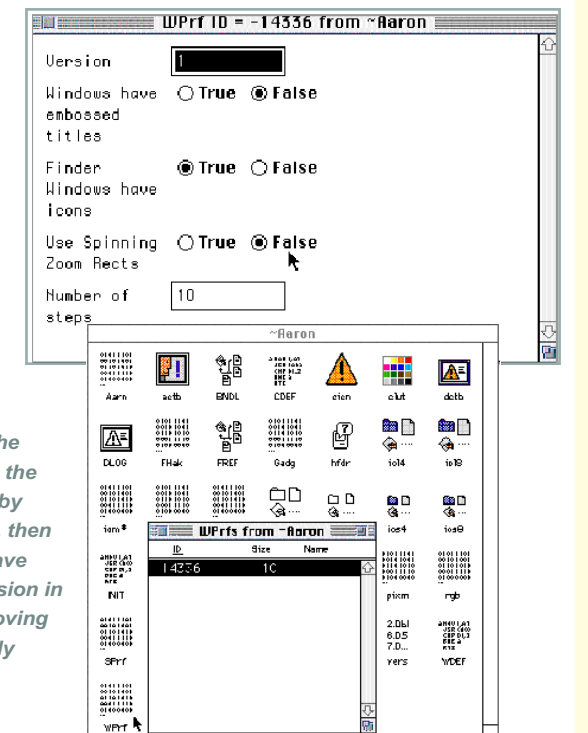
2. You now have access to the preference settings. Change the Zoom Rects option to False by clicking the button next to it, then close all the windows and save changes. Place this new version in your extensions folder, removing the old one first if you already have it installed, and restart

3 2 6
PERSONAL COMPUTER WORLD
JUNE 1996

3 2 7
PERSONAL COMPUTER WORLD
JUNE 1996

ResEdit rules

One of the most useful utilities ever produced for the Mac is a small program called ResEdit. As its name suggests, it's used for editing the resources and components in Mac applications. The latest version is 2.1.3.

This month, I used it to solve a couple of problems I was having with Aaron and Adobe Photoshop. Aaron, for the uninitiated, is a small shareware extension that changes the Finder's appearance so that it looks more like Apple's up and coming Copland operating system.

It gives you bas-relief shaded menus and windows, cool-looking 3D icons for folders and a nice new Wastebasket. But it also gives you really annoying spinning windows that slow everything down on low-end PowerMacs, which is where ResEdit comes in.

With the help of ResEdit you can open up Aaron and adjust its internal preference settings to turn off this feature. To do this, follow the simple steps shown in *Figs 1 & 2*. ▣

Fig 2 Patching Adobe Photoshop

The Adobe Photoshop manoeuvre is a delicate operation. It comes courtesy of *PCW*'s DTP guru Gordon Laing, and Photoshop programmer Doug Olsen.

It fixes a problem with Photoshop 3.0.4 or above, which prevents the application from recognising drag and drop operations with non-Photoshop files. This can be extremely annoying if you constantly need to edit images generated in another package, or on the PC.

Before attempting to patch Photoshop, it is advisable to make a duplicate of the main program in case anything goes wrong. Once you've done this, open the program with ResEdit and perform the following steps:
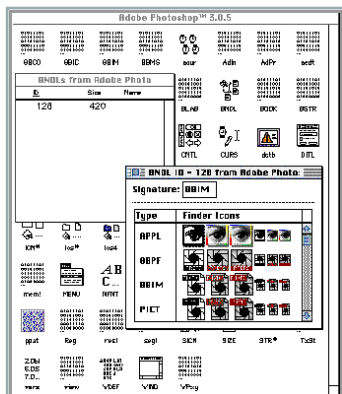
1. With the main ResEdit window open, find and double-click the resource labelled BNDL. As in Aaron, this opens a window with numbers in. Double-click them to reveal another window
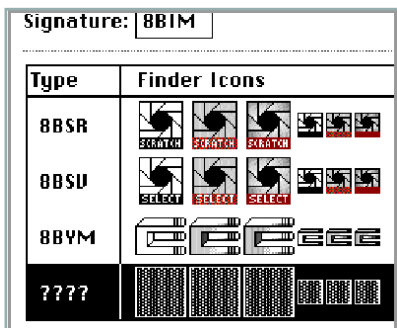
2. The new window shows a group of Photoshop Finder icons associated by the program to different file types. We need to make a new file type, so select Create New File Type from the Resources menu. A new line of empty icons will appear with the File Type ????
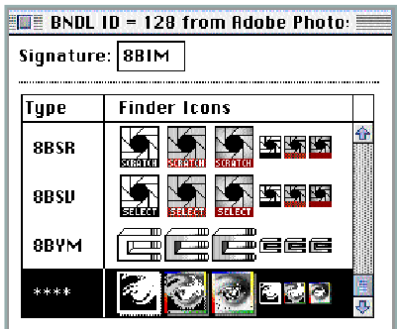
*3. Click on the question marks and change the entry to ****, then select Choose Icon from the BNDL menu. Scroll all the way to the top of the window that appears and double-click the first Photoshop icon. The icons will be assigned to the new file type*

4. Finally, close all windows and save changes when prompted. Restart the Mac and rebuild the desktop by holding down Option and Command during startup. Photoshop should now recognise those foreign files

Did you know?

The Mac's interface is renowned for its ease of use, but occasionally you do come across something that's highly annoying.

One particularly irritating thing, especially for those used to Windows 95, is the way in which windows can become cluttered and disorganised when in the normal icon view. Icons often become overlapped, or move out of the viewable area.

Apple's "Clean up Window" command offers a partial solution and, when selected, slowly moves every icon on to the nearest gridline. This can still leave you in a mess, however, especially when you've got icons outside the view.

The solution is to hold down the Option key while selecting the Special menu — "Clean up Window" becomes "Clean up by Name". Selecting this will quickly sort the contents into alphabetical order and line up the icons as much as the filenames will allow.

PCW Contacts

Chris Cain loves to hear from Mac users and can be contacted via the usual *PCW* address or on email as **chris_cain@pcw.ccmail.compuserve.com** or **CainUK@aol.com** or **chris@cix.compulink.co.uk.**

ResEdit from Full Moon Software **01628 660242**
Apple Computers **0181 569 1199**
Apple Customer Response Centre **0990 127753**

Apple's home pages are **www.apple.com** and **www.euro.apple.com**

Q "I have read so much about different sound cards that I am not sure of anything except that *PCW* recommends at least a wavetable version.

I currently have an Amiga with MIDI interface connected to a Roland e-10 keyboard and run the Sequencer One software. This is quite good, but I am limited to the keyboard for sounds as the Amiga is a bit limited (only four channels) and the keyboard is not general MIDI, just plain MIDI. I plan to buy a Gateway P100 with an Ensoniq sound card and speakers in the next couple of weeks.

How does PC sequencing work? Will I be able to use my Roland for just the keys and utilise the GM-sounds on the PC-card? Do sound cards have MIDI interfaces built in? How good will the PC sounds be — on a par with a good keyboard? Is a good sound card like a synthesiser without the keys? I don't want to buy a PC and then find I still have to use my Amiga. And what does 'wavetable' mean?

Your advice would be appreciated."
Neil O'Connor

The de-facto standard sound card for the IBM PC is the SoundBlaster 16 made by Creative Labs. Most other sound cards are compatible with this and use it as their base-level specification, so it's a good place to start.

There are six main components to the card: a synthesiser, a DAC/ADC section for playing and recording digital sound (known as wave files), a mixer which adds the various sound sources together, a MIDI and a joystick port, and some form of CD-ROM drive interface.

The joystick port is really only useful for entertainment applications and needs no further explanation. The CD-ROM interface is generally of the IDE type in current sound boards, if they support one at all. In the early days, sound boards formed the hub of a multimedia upgrade so included proprietary CD-ROM interfaces.

The ADC and DAC (Analogue to Digital Converter and vice versa) is used to record and play sound samples. These days they are nearly all capable of operating in several quality modes up to 16-bit samples at 44kHz or greater, and in stereo. However, this isn't as useful as it sounds for music applications unless you are interested in using the PC as a digital recorder; which is actually a practical proposition.

The interesting parts for the music maker are the synthesiser, the mixer and the MIDI ports. The basic synthesiser is of the FM (Frequency Modulated) type. This uses the same principle as the Yamaha

DX7, among others, which was responsible for many of the uninspired backing track sounds of the early eighties.

The normal FM synthesiser chip found on sound boards is the OPL3. If you like this sort of sound you can certainly have some fun with its 20 partials (simultaneous sounds). However, just because it can make 20 distinct noises at once, you might be disappointed to find it isn't much of an improvement on the Amiga's four.

The Amiga had a system which allowed each of its sound channels to play very rich sounds, whereas you have to gang up several FM partials to get good effects.

The better sound cards use a system called Wave Table synthesis, in which the notes are actually stored as digital recordings. These sample recordings are used to calculate the output wave for the required note as and when required — not an easy job, but the effect is often quite realistic.

Most wavetable synthesisers can handle 32 partials. Each partial can be used on its own and still produce a rich sound. While this may be adequate for popular music, don't try to simulate an orchestra!

If you have a sound board with basic FM synthesis and you want to upgrade to wavetable, this can sometimes be done using a daughterboard. These plug on to a sound board with a suitable socket and appear to the PC to be an extra, external, MIDI synthesiser. In fact, it is possible to upgrade some wavetable cards like the AWE-32 with an additional wavetable module if you want to go mad. Several upgrade daughterboards are available, the most famous being Creative Labs' own WaveBlaster.

The MIDI ports are all fairly standard and trouble free once you've discovered

Any **questions**?

Make musical waves with a card like the Sound-Blaster AWE-32 PnP

that they need an external adaptor cable to make them work. The cable itself contains the opto-isolators missing from the sound board in a large plug.

For some strange reason, the MIDI signal comes out of spare pins on the joystick socket rather than having a connector of its own.

You will certainly be able to make use of the Roland keyboard by connecting it to the MIDI port. Sequencing software is readily available and basic packages are often bundled with the sound boards. The synthesiser built in to the sound board appears just like any other MIDI instrument in the chain.

Don't get too concerned about General MIDI. What it boils down to is that a GM instrument will have the same sounds on standard patch numbers (for example, 1=Piano, 2=Electric Piano). If your instrument doesn't conform to GM numbering you will have to configure to software so it knows how to translate GM-numbered MIDI files.

Dash it all

"My friend's PC always adds a '-' in documents when using the right arrow cursor movement key. Can you tell me how to stop this from happening?"
Max Waterman

This sounds like an incompatibility between the keyboard driver and the word processor. The first thing to try is to remove any drivers like ANSI.SYS or NANSI.SYS from the CONFIG.SYS file and anything else which looks like it might be related to the keyboard from both

The key to compatibility is the keyboard. Since the IBM AT, shown here, all keyboards have been interchangeable

CONFIG.SYS and AUTOEXEC.BAT. The lines in question might contain KEYB, KEYBUK or KEYBOARD.SYS depending on your DOS version.

If this cures the problem, then start adding them one at a time to isolate the culprit. The reason for suspecting display drivers like ANSI.SYS and its numerous alternatives is that they often intercept the keyboard, too.

It could also be the case that the word

processor you are using requires a particular keyboard or display driver which you don't have installed. Check its documentation to find out.

You may have a hardware problem with the keyboard. If it is a standard PC, the best way to prove it is to try a different keyboard.

Since the IBM AT (and other 80286-based models) all the keyboards have been generally interchangeable as long as they have the right plug fitted. The main exception to this rule is the early Amstrads. Mixing pre-AT and post-AT keyboards is not good news as they run at different voltages.

Taking a chance on Acrobat

"I have hundreds of documents in Page-Maker 5 format and I need to get them into Microsoft Excel 5.0 or Microsoft Word for Windows 6.0.

Adobe have told me that PageMaker doesn't support any export facilities and that, basically, I don't have a chance. Is there any medium that could be used to convert PageMaker files with .PM5 format into a format such as .bmp or .wmf, that could be embedded into the above applications, or inserted as objects or pictures?"
Jason Smith

This could be a job for Adobe's latest bandwagon following PostScript — Acrobat. This is a system which is intended to allow you to create documents on one machine, which can then be read by all the computers in the entire world. Okay, so it's not quite universal yet, but they are doing quite well with DOS, Windows, OS/2, Macintosh and Unix support.

In case your intended recipient doesn't have an Acrobat reader on their machine, you're currently allowed to give them one free of charge.

To create the documents in the first place, you can use any application you like as long as it has a print option. You then

"print" the final version to Acrobat Exchange which converts it into its own standard format (PDF) and stores it in a file. It's as simple as printing it to a printer.

The results can be very good: when viewed, the documents appear to be practically identical to paper versions. PDF files can also be embedded as OLE objects under Windows, which is how they might solve your problem. Unfortunately, however, you don't seem to be able to see the contents unless you actually open the embedded object.

It's probably possible to convert documents into .BMP format but they would end up taking up somewhat more disk space than the originals, to say the least. PDF files appear to be relatively compact, especially considering the cross-platform compatibility they achieve. ◼

Frank's Bargain Basement

By the time you read this, RAM prices will have fallen considerably — and about time, too. I expect 16Mb to be costing less than £200, which is probably low enough to tempt many into carrying out their Windows 95-induced upgrade plans.

So why has it happened? And will prices fall further? More rubbish is talked about RAM supply that most other aspects of the computer industry. Regarding this price movement, I've been told that it was down to the Chinese New Year creating a world glut because all the Far East clone makers closed down for the holiday. Oh yeah? If they did close down the factories, which I somehow doubt, it wouldn't have been for the full two weeks of celebrations. Pull the other one. I think it's far more likely that the DRAM manufacturers have decided to supply Europe direct and get around the 80 percent tariff imposed by the US government. I smell whole-output contracts lapsing left, right and centre.

In the short term, prices are bound to stabilise and probably go up a bit once dealers realise that their large stocks are a liability in a falling market. For the latest situation, have a look at the Computer Answers Web page (see the "Contacts" panel, below).

PCW Contacts

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There is a web site at **http://www.users.dircon.co. uk/~wombat/answers/** which may contain late-breaking news. Letters may be sent to *PCW* at *VNU House, 32-34 Broadwick Street, London W1A 2HG.*
Sorry, but due to the high volume of correspondence, individual replies are not normally possible.

Monitor/keyboard sharing
Q-Data (MARC Software)
01349 866127
Keyzone (Various hardware)
0181 900 1525
Sound boards
Creative Labs (various Blasters)
01245 265265
Aztec (Galaxy series) 01734 814121
Orchid (NuSound) 01256 479898
Adobe (Acrobat) 0131 451 6888

manufacturer offer guaranteed response times?
• Check the technical support. Is it free? Is it easy to get through to?

PCW Minimum Specification

This is the absolute minimum spec we think you should even consider buying now. It's suitable for general business use: word processing, databases and spreadsheets.
• Windows 3.11
• 486 DX2 66MHz processor
• 8Mb RAM
• Graphics card with 1Mb of memory
• 340Mb hard disk
• 3.5in floppy disk drive
• Double-speed CD-ROM drive
• 14in colour monitor
• PCI local bus

If you're buying the PC for home use, you'll probably want full multimedia capabilities so that you can use CD-ROM games and edutainment products and play video clips. This should include at least a
• 16-bit SoundBlaster-compatible sound card
• Speakers

PCW Recommended Specification

If you're not completely strapped for cash this is the PC specification we recommend. Certainly no-one who works at PCW would consider buying anything less.
• Windows 95
• Pentium 90MHz or 120MHz processor (a faster processor will make your computer run more quickly and smoothly)
• 256Kb secondary cache (again this makes your computer run faster)
• 16Mb EDO RAM. 16Mb of memory speeds your PC up a lot, particularly if you're multitasking (using more than one application simultaneously)
• Graphics card with 2Mb of memory
• 500Mb hard disk — modern computer software takes up a lot of space
• 3.5in floppy disk drive
• Quad-speed CD-ROM drive (video clips will play more smoothly; you will be able to access files on CD-ROM disks more quickly)
• 15in colour monitor (one inch doesn't sound a lot, but is easier on the eyes)
• 16-bit SoundBlaster-compatible sound card
• Speakers
• PCI local bus

Buying a PC

The one universal rule with PCs is that they get "cheaper, better and faster" over time. This can happen at a bewildering rate, with the result that your state-of-the-art PC becomes outdated and old-fashioned in a couple of years. It may still work perfectly well, but it probably won't run very fast and won't run the latest software. If you're just planning to do simple word processing, this probably won't matter. But we're assuming here that you want to buy a general-purpose multimedia PC that can play games, use CD-ROMs and run a range of modern sofware.

Things not to do when buying
• Don't buy a machine with less than 8Mb of memory.
• Avoid older VESA local bus motherboards.
• Avoid cheap 14in monitors.

Things to do when buying
• You can never have too much disk

space. Spend extra cash on the next hard disk size up.
• Memory is expensive, but upgrading from 8Mb to 16Mb makes a huge difference to performance.
• Look at the bundle. What other software is included — is it worth having?
• Check the warranty. Is it on-site or back to base? If it's on-site, does the

PCW Best Specification

Our Best Spec is as good a PC as you are likely to need for most software. For some specialist applications, like professional DTP or CAD, you may need to add even more memory, a bigger hard disk, a more powerful graphics card, or a larger monitor.
• Windows 95
• Pentium 133MHz PC
• 512Kb secondary cache
• 32Mb EDO memory
• 1Gb hard disk
• 3.5 in floppy disk drive
• Six-speed CD-ROM drive
• 17in colour monitor
• 2Mb VRAM graphics card (this means your graphics card can display more colours and a higher resolution on your monitor — Sixteen million colours at a resolution of 800 x 600, to be exact)
• 32-bit sound card
• Quality speakers
• PCI local bus

Other things to consider

PCs have become a lot more similar in the last few years. The days when smallish computer companies designed their own chipsets (the computer chips that assist the computer's main processor) are long gone. Most small box-shifters buy their motherboards from Taiwanese manufacturers. Larger companies either design their motherboards themselves (Apricot, Compaq, IBM) or get motherboards built by other companies to their specifications (Gateway).

Buying a NOTEBOOK

Notebooks are one area in which it's often safer to stick to brand-names. Not that some of the Far Eastern kit doesn't work perfectly well, but reliability does seem to be a problem and it can be fiendishly difficult to obtain spares. The other useful guideline for notebooks is to try before you buy.

Standard notebook specifications are generally a step or two behind the desktop equivalents. For example, quad-speed CD-ROM drives are still not standard on notebooks, where on desktops the six-speed variety are already well established. The latest generation of colour screens can cope with 800 x 600 resolution, but that's still a step behind the desktop 1024 x 768 standard.

What to look for in a notebook
• **Pointing device** There's been a wholesale move from trackballs to trackpads. Some notebooks, notably IBM Thinkpads, use stick technology (a thing which looks like the rubber on top of a pencil and is controlled using one finger).
• **CD-ROM** drives are rapidly becoming standard in notebooks. If your notebook is going to be your only machine, it's worth getting one.
• **Floppy disk drive** Often there's a choice between a CD-ROM drive and a floppy disk drive. Again, if the notebook is to be your only machine, specify both. Otherwise, reinstalling an operating system can mean returning the machine to the manufacturer.
• **PC cards** Modern notebooks all have at least one PC card slot. They take credit-card sized expansion cards which can add a fax-modem, a network interface card or even an extra hard disk to your computer.
• **Battery life** Battery technology keeps improving, but unfortunately the power demands of ever more powerful notebooks tend to keep pace. Battery life varies from as little as 30 minutes over six hours. Lithium Ion and Nickel Metal Hydride batteries have now largely replaced the

older Nicad (Nickel Cadmium) batteries.
• **TFT screens** TFT or active matrix screens are starting to replace the slower dual-scan or passive matrix screens. It means the screen image is refreshed much more quickly.
• **Warranty** Drop a notebook and it may well break. This means it's especially vital to check the terms of your warranty. How long is it? What level of service is provided.

PCW Minimum Specification

Notebooks change rapidly. It's often possible to pick up end-of-line machines with 486 processors from brand-name manufacturers such as Toshiba and Compaq at discounted prices of £1,000 or less. These can be a very good buy. Just make sure they can run the software you need to use. They probably aren't up to running Windows 95.

PCW Recommended Specification
• Windows 95
• Pentium
• 256Kb secondary cache
• 16Mb RAM
• On-board graphics with 1Mb of memory, PCI local bus
• 500Mb hard disk
    • 3.5in floppy disk drive and/or dual-speed CD-ROM drive.
    • Dual-scan screen.

PCW Best Specification

The state of the notebook art. You're either loaded, or your company's picking up the tab.
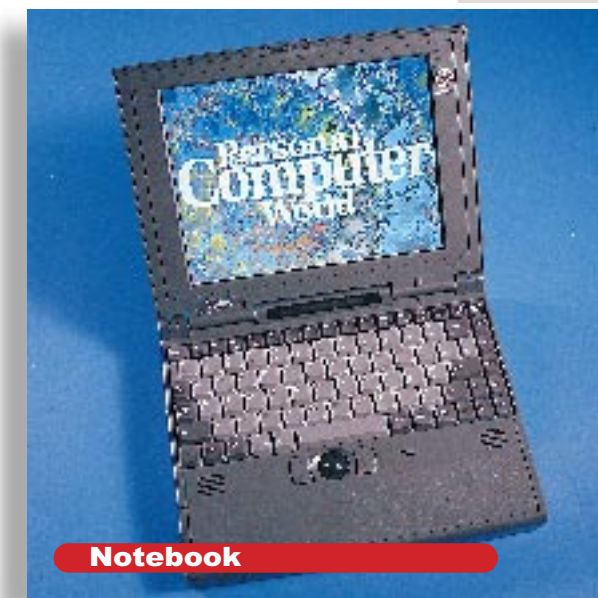• Windows 95 or Windows 3.11
• Pentium
• 256Kb secondary cache
• 16Mb RAM
• On-board graphics with 2Mb of VRAM memory, PCI local bus
• 1Gb hard disk
• 3.5in floppy disk drive
• Quad-speed CD-ROM drive
• Active matrix TFT screen
• Long battery life

Notebook

GLOSSARY OF COMPUTING: IMPORTANT TERMS AND ACRONYMS

A

Access Time
The time it takes for a device to access data. The access time, quoted in milliseconds (ms) for hard disks and nanoseconds (ns) for memory, is usually an average, as it can vary greatly. Together with the transfer rate, it is used to gauge the performance of hard disks and other devices. The lower the number, the better the performance.

Acronyms
These form most of the technobabble which has been refined over many years to confuse you, the user, and keep us, the writers, in business. Try to take as little notice as possible of it: the computer industry is littered with TLAs (Three-Letter Acronyms).

Applications
An application, or package, is one or more programs used for a particular task: for example, word processing, invoicing or spreadsheeting. Applications are bought shrink-wrapped (wrapped in cellophane for general use) or custom-built for more specific uses.

ASCII (American Standard Code for Information Interchange)
Usually a synonym for plain text without any formatting (eg italics, bold or hidden text). Since computers naturally use binary rather than Roman characters, text has to be converted into binary for the processor to understand it. ASCII assigns binary values to Roman characters. RTF, a Microsoft standard, adds extra formatting features to plain ASCII.

B

Backwards compatible
Compatibility of hardware or software to older versions of the product or standard.

Baud rate
The amount of data that can be sent along a communications channel every second. In common usage, it is often confused with bits per second. These days modem speeds are normally measured in bits per second. (See V* and Bit)

BIOS
Basic Input/Output System (pronounced buy-oss). Software routines that let your computer address other devices like the keyboard, monitor and disk drives.

Bit
Binary digit, the basic binary unit for storing data. It can either be O or 1. A Kilobit (kbit) is 2^{10}, 1024 bits; and a Megabit is 2^{20}, which is just over a million bits. These units are often used for data transmission. For data storage, Megabytes are more generally used. A Megabyte (Mb) is 1024 kilobytes (Kb) and a Kb is 1024 bytes. A Gigabyte (Gb) is 1024 Mb. A byte (binary digit eight) is composed of eight bits.

Bug (See Crash)

Boot
Short for bootstrap. Refers to the process when a computer loads its operating system into memory. Reboot means to restart your computer after a crash, either with a warm reboot (where you press Ctrl Alt Del) or a cold reboot, where you switch the computer off and back on again.

Bulletin board systems (BBSs)
A kind of electronic forum now being replaced by the Internet. (See net.newbies, p207)

Bus
A "data highway", which transports data from the processor to whatever component it wants to talk to. There are many different kinds of bus, including ISA, EISA, MCA, and local bus (PCI and VL-bus).

C

Cache (See Memory)
COAST
Cache On A Stick.
CD-ROM
A CD-ROM is the same as a normal audio CD, except it can store data as well as sounds. A CD-ROM player can be attached to your computer to read information from the CD-ROM into the computer's memory in the same way that a domestic CD player reads information from the CD into your hi-fi. The advantage of distributing information on CD-ROM rather than other media is that each one can hold up to 680Mb of data — equivalent to some 485 high-density 3.5in floppy disks. The disdvantage, however, is that you can only write once on CD-ROMs, but this makes them ideal for archiving.

CISC (See **RISC**)
CPU
Central processing unit. Normally refers to the main processor or chip inside a PC. (See Processor)

Crash
Common term for when your computer freezes. Can be caused by a power surge, a bug (which is a fault in software), or a GPF.

D

DRAM (See Memory)
DOS (Disk Operating System)
Once the standard operating system for PCs, it is now being replaced by Windows 95 and Windows NT.
DPI (Dots Per Inch)
Common measure of the resolution on a printer, a scanner or a display.
Drive controller card
An expansion card that interprets commands between the processor and the disk drives.
Drivers
Pieces of software that "drive" a peripheral. They interpret between the computer and a device such as a CD-ROM. If you have a SCSI CD-ROM drive connected, you will be able to use it on a PC or a Mac, just by loading up the relevant driver on each machine.

E

EIDE (See IDE)
EISA (Extended Industry Standard Architecture)
A bus standard designed to compete with MCA now being replaced by PCI. Its advantage was that it was designed to be backwards compatible with the now-ancient but still dominant ISA interface (as the name implies).
Electronic mail (E-mail, email)
(See net.newbies, p207)
Expansion card
Circuit boards that fit inside PCs to provide extra functionality. For example, one might be an internal modem, providing the same functions as an external one (which are more common) but sitting inside the PC. Expansion cards are designed to be fitted and removed by people with little knowledge of PCs.

F

Floppy disk drive
Practically all PCs come with a floppy disk drive. 3.5in HD (high density) 1.44Mb floppy disks are now the standard. They come in hard plastic cases and have replaced the older, literally floppy 5.25in disks.
Fonts
A font is an alphabet designed in a particular style. Fonts apply to both screen and printed letters. Modern TrueType and Type 1 fonts are stored as shape descriptions, scalable to any size.
Format
To wipe a floppy or hard disk in order to prepare it to accept data.
Graphics Card
An expansion card that interprets commands from the processor to the monitor. If you want a better, higher-resolution picture or more than your existing setup, you'll need to change your graphics card and/or your monitor.
GUI (Graphical User Interface)
(See Windows)

Hard disk
Sometimes called a fixed disk, hard disks are hermetically-sealed rigid disks able to store data and programs. Disk capacities increase all the time. The standard is now 1Gb, but disks of up to 9Gb are available.
Hardware
All electronic components of a computer system, including peripherals, circuit boards and input/output devices.
HTML (Hypertext mark-up language)
The standard language used in the creation of World Wide Web pages.

I

IBM-compatible
Originally meant any PC compatible with DOS. Now tends to mean any PC with an Intel or compatible processor capable of running DOS or Windows.
Internet
(See net.newbies, p213)
IDE
Integrated drive electronics. A control system designed to allow computer and device to communicate. Once the standard for PC hard disks, now being replaced by EIDE (enhanced IDE) which offers improved performance and extra features. EIDE can support four external devices including hard disks and CD-ROM drives.
IRDA
Infra Red Data Association — standard for exchanging data using infra red typically from PDAs or notebooks to a PC or printer.
ISA (Industry Standard Architecture)
This was the original bus architecture on 286 PCs. Also known as the AT bus (the 286 was known as the AT), it is still in use today. Slow by modern standards, but so widely accepted that expansion cards are still made for it. (See EISA, PCI)
ISDN Integrated Services Digital Network
A digital voice and data telephone network which looks set to replace the current analogue one. ISDN adaptors are already starting to replace modems as a fast way of accessing the Internet and transferring data.
JPEG (See **MPEG**)
Kbit (kilobit), Kb (kilobyte)
(See **Bit**)

L

LAN (Local Area Network)
(See **Network**)
Local Bus
PCI (Peripheral Component Interconnect), developed by Intel, is now the standard for local bus architecture. It is faster than the older VL-Bus (Video Electronic Standards Association local bus) it has now largely replaced.

M

Macintosh (Mac)
A kind of personal computer, made by Apple, that is incompatible with PCs. Developed as a rival standard, its operating system looks like Windows, except that it predates it and (in many people's view) looks and works much better.
Maths co-processor
A specialised chip that handles mathematical calculations (floating point operations) for the processor. Modern processors such as the Pentium have a co-processor built into them.
Mbit (megabit) (See **Bit**)
Mb (Megabyte) (See **Bit**)
MCA
A kind of bus designed by IBM to beat EISA. Although faster, it never became popular because every machine that used it had to pay a royalty to IBM, and because it was not backwards-compatible with ISA.
MPEG (Moving Picture Expert Group)
A standard for compressing video available in several flavours: MPEG 1, MPEG 2 and MPEG 4. JPEG (Joint Photographic Expert Group) is a standard for still image compression.
Memory
The term normally refers to RAM (Random Access Memory). This is the kind that disappears whenever you turn your computer off and is much faster to access than a hard disk. It acts as a kind of staging post between your computer's hard disk and its main processor.
•DRAM Dynamic Random Access Memory
This requires its contents to be replaced every 1/1000th of a second and is the most common form of memory in PCs.
•SRAM StaticRAM
Retains memory until the power is switched off.
•VRAM VideoRAM
Faster than DRAM, this is used by graphics cards.
•EDO Extended Data Out RAM
The latest type of memory, offers improved performance.
Cache memory
Temporary memory set aside to store the information that is accessed most frequently. The Pentium processor has 8Kb of cache built in. This can be further speeded up by a secondary cache, typically 256Kb. Part of your DRAM is also often used to cache your hard disk.
ROM Read-Only Memory
A kind of memory that can only be read: you can't make changes to it as you can to RAM. It is commonly used for things that will never need to be changed, such as the information the computer requires when you start it up.
Modem
The word is a contracted version of "modulator/demodulator", which means that a modem is a box (or, less commonly, an expansion card) that lets your computer talk over phone lines to other computers. They are commonly used for sending electronic mail and accessing the Internet. (See net.newbies, p213)
Monitor
Your computer's screen. Signals are sent to it from the video card.
Motherboard
The main printed circuit board which houses the processor, the memory and various other components.

N

Network
A network is a group of computers linked together with cable. The most common form is a LAN (Local Area Network), where electronic mail and other files can be exchanged between users without swapping floppy disks. Printers and other resources can be shared. Typically, all the PCs on a LAN are connected to one server, a powerful PC with a large hard disk that can be shared by everyone. There are many other forms of interlinking computers including WANs (Wide Area Networks).

O

Operating System
The operating system communicates with the hardware and provides services and utilities to applications while they run, such as saving and retrieving files.

P

Package (See Application)
PC Card
Formerly PCMCIA. A standard to allow PCs, particularly notebooks, to be expanded using credit-card sized cards.
PDA (Personal Digital Assistant)
Small electronic organisers. The Psion 3a is a typical example.
PCI (See Local Bus)
PCMCIA (See PC Cards)
Parallel Ports
Used by your PC to communicate with the outside world, usually via a printer. Information can travel in parallel along a series of lines, making it faster than serial ports which can only handle one piece of information at a time.
Pixel
Picture element. The smallest possible addressable dot displayed on a monitor.
PowerPC
This family of RISC chips is the result of a collaboration between IBM, Apple and Motorola. It is now used in all Apple Macintosh computers and many IBM workstations.
Processor
The chip that does most of a computer's work.
Programs (See Applications)
Public Domain
Software that is absolutely free. The author usually retains copyright, but you can make as many copies as you want and pass them to other people. Public domain software often consists of small utilities the author feels might be useful to other people. It is often confused with shareware.

Q

QWERTY
The name of a standard English language keyboard, derived from the first six letters on the top row. The French equivalent is AZERTY.

R

RAM Random Access Memory (See Memory)
Reboot (see Boot)
RISC
Reduced Instruction Set Computing. These are starting to replace CISC (Complex Instruction Set Computing), as they are generally faster. The PowerPC chip is a typical example.
ROM (Read Only Memory) (See Memory)
RTF Rich Text Format (See ASCII)

S

SCSI
Small Computer System Interface is a bus that comes as standard in a Macintosh and is starting to rival EIDE on PCs. It is commonly used for connecting devices such as hard disk drives and CD-ROM drives.
Serial Port

336
PERSONAL COMPUTER WORLD
JUNE 1996

337
PERSONAL COMPUTER WORLD
JUNE 1996

GLOSSARY OF COMPUTING: IMPORTANT TERMS AND ACRONYMS

The serial port, of which there are sometimes two (com1 and com2), is used by your PC to communicate with the outside world. They are predominantly used by modems and similar devices, which communicate quite slowly. Some mice also use them. Faster communications are achieved via the parallel port.

Shareware
A way of distributing software which is often used by smaller programmers rather than big software houses. It is freely available, but not free. You are honour-bound to pay a small fee to the software's developer if you continue to use the program after a set period.

SIMM (Single Inline Memory Module)
The standard modules for memory expansion on PCs. Older 30-pin SIMMs have now been replaced by the 72-pin variety available in capacities of up to 16Mb.

Software
A generic word for programs or applications

T
Tape Streamer
Magnetic tape recorder designed for backing up data from your hard disk.

U
UART (Universal Asynchronous Receiver Transmitter)
Pronounced you-art. A chip that allows your PC to cope with high-speed communications.

V34, V32bis
A series of CCITT standards that defines modem operations and error correction. There are over 20, but the key ones are:
• V32.bis — the standard for 14,400bps modems.
• V34, the new standard for 28.800bps modems (see Baud). Don't buy a modem that doesn't comply with one of these standards.

VESA (See **Local Bus**)

VGA
Video Graphics Array is the name given to a popular display. VGA graphics have 640 pixels horizontally and 480 vertically, and can display 16 colours. SuperVGA (SVGA) graphics can display 800 x 600 or 1024 x 768 in as many colours as the memory in your graphics card will allow: up to 16.4 million, or true colour.

VL-Bus (See Local Bus)
VRAM (See Memory)

W
Windows
A GUI (Graphical User Interface) developed by Microsoft. Windows is supposed to make programs easier to use by giving them a standard, mouse-driven interface.

Windows 3.11
16-bit operating system.

Windows NT
Robust, fully 32-bit operating system. Currently has the Windows 3.11 interface, but will soon be available with the Windows 95 interface.

Windows 95
Major improvement to Windows 3.11, with a completely redesigned interface. Now less prone to crashes and easier to use, but requires more memory.

WYSIWYG
An acronym for What You See Is What You Get, an over-used but useful word to describe much modern software. What you see on the screen is exactly what you see when you print your work out.

Z
ZIF (Zero Insertion Force)
Sockets used for large CPUs. Lifting a handle lets you remove the processor.

ZIP
Better known as PKZIP, this is a widely used shareware utility that compresses files — making them smaller, so that they take up less room. You can tell when you have a ZIPped file as its name ends in ZIP. It is widely available from bulletin boards. PKZIP is the most common form of compression of its kind.

Glossary ends

Buying a
PRINTER ▶

There are two main types of printer: laser and inkjet.

Lasers
Most office printers are lasers. They work pretty much like photocopiers, and are cheap to run and print quickly. Their disadvantage is higher initial cost and mono output. Laser printers are available in all sizes and at all prices. Small desktop printers cost as little as £400. You can buy colour laser printers but they are still expensive, typically £5,000 or more.

Types of laser
PCs work by sending a description of the page that's being printed down a printer cable. There are three commonly-used page description languages (PDLs):

Laser printers

PostScript
This sends an outline in vector form (see "Drawing Software") to the printer where it is rasterised (converted into dots) and printed to the device's best ability. PostScript is device-independent so that the image looks the same on a monitor (75dpi), a laser printer (300dpi) or a professional image setter (2400dpi).

PCL
This stands for Printer Control Language, and it is Hewlett-Packard's alternative to PostScript, licensed to many clone-printer manufacturers. Printers using this tend to be cheaper than PostScript ones, but output will vary from one printer to another, making it less suited to professional use.

GDI (graphical device interface)
These printers download the description of your page already used by Windows straight to your printer. They will only work with Windows, but are cheap and fast. They are also only suitable for a personal printer and will not work across a network.

Inkjets

Inkjets
Inkjets work by spraying ink onto paper. They are cheap to buy but more expensive to run, and slower. Even cheap inkjets can print in good-quality colour.

Recommended Products
Cheap lasers Epson EPL-5500: Epson 0800 220546; street price £300 (see *PCW* February 96)
Sub-£750 lasers Hewlett-Packard 5P: Hewlett-Packard 01344 369222 (see *PCW* November 96)
Network lasers Hewlett-Packard 5P: Hewlett-Packard 01344 369222 (see *PCW* February 96)

Recommended products
Epson Stylus 800 colour: Epson 01442 61144; street price £350 (see *PCW* August 95). **Canon BJC-610**: Canon 0500 246246; street price £370 (see *PCW*, February 96).

Hybrids
For home use and small offices a hybrid could be the answer. These combine a printer, a fax machine and some copying capability in one unit.

Recommended products
Hewlett-Packard OfficeJet LX: HP 01344 369222; street price £499 (see PCW December 95)

Hybrid printer

Document scanners

Buying a
SCANNER ▼

Scanners are used to import text, graphics or pictures into a PC. They vary from low-cost hand scanners not much bigger than a mouse, to drum scanners costing thousands of pounds. The latter are designed to scan photographic transparencies to professional standards.

Flatbed scanners
The most common type of scanner. They range in price from £300 to over £3,000. They're capable of scanning colour pictures to a high standard. Most have transparency adaptors as an optional extra.

Document scanners
This is a new category which aims to combine the reliability of flatbeds with speed and portability. They're intended for OCR and document management. Most will cope with photographs and some with colour, but it's not their forté.

Flatbed scanners

Recommended Products: Flatbed Scanners
Professional — Arcus II: Agfa 0181 231 4200; street price £2,600.
Intermediate — Epson GTX 9000: Epson UK 01442 61144; street price £750.
Budget —Umax Vista T-630: IMC 01753 830999; street price £450 (*PCW*, July 95).

Recommended Products: Document Scanners
Visioneer PaperPort VX: Computers Unlimited 0181 200 8282; street price £299. **Logitech PageScan Colour:** Logitech 01344 894300; street price £299.
Plustek PageReader 800: Scan Direct 01292 671676; street price £149 (*PCW*, March 96).

Buying a
FAX-MODEM ▶

You'll need a modem to connect to the Internet or an online service such as CompuServe or AOL, and to send and receive email. Modems are available in three formats: as PC cards to plug into notebooks, as external boxes, and as expansion cards. PC card modems cost the most and external modems cost slightly more than the expansion card variety.

Apart from the case and the external power supply, there's often little difference between the internal and external versions of a modem. Most modems now have fax capability built in, which means you can receive faxes on your PC to view or print out. If you're strapped for cash, a V32bis 14,400Kbits/sec modem is adequate. However, prices have now fallen so rapidly that a V34 28,800Kbits/sec modem is probably a better bet.

Recommended Products: Fax-modems
External — Motorola 3400 Online: Motorola 01923 404343; street price £160 (see *PCW* February 96)

Fax-modem

Buying a
CD-ROM DRIVE ▼

Just about the only things which differ on today's CD-ROM drives are their speed and means of connection. The most common connection is IDE or Enhanced IDE (EIDE). It is possible to connect an IDE CD-ROM drive to most existing IDE hard disk controllers. Older PCs may need a newer EIDE controller. IDE controllers are also found on many sound cards.

The first CD-ROM drives spun the disc at the same speed as an audio CD and were called single-speed, delivering a sustained data transfer rate of 150Kb/s. Double-speed drives spun twice as fast, doubling the data transfer to 300Kb/s, and quad-speeds twice as fast again, raising transfer to 600Kb/s.

Quads are currently the standard, with six-speeds (900Kb/s) becoming increasingly common. Manufacturers are beginning to release eight-speed drives, offering up to 1200Kb/s. All figures are theoretical

CD-ROM Drives

maximums. Buyers should go for quad-speed or higher. There is little to choose between models, but off-the-shelf supplies are frequently short. Internal IDE quads start at around £100 and six-speeds around £130.

Recommended Product: CD-ROM Drive
Teac CD56-E six-speed: fitted to many new PCs and costing around £170 (*PCW* January 96)

Buying a
MONITOR ▼

Regardless of your computer application, you'll be looking at your monitor all day — so get a good one.

Some people claim not to see monitor-flicker, but your brain will, resulting in fatigue and headaches. A refresh rate of 70Hz or higher will produce a flicker-free image on most monitors. Interlacing also results in flicker. Always run in non-interlaced modes and ignore interlaced quotes.

The resolution refers to the number of dots (pixels) horizontally and vertically on screen. Standard VGA mode runs at 640

Monitors

x 480 pixels, while other typical modes include 800 x 600 and 1024 x 768. The more pixels, the more you'll be able to fit on screen, but everything will be smaller and may only be suitable on a physically larger screen. Buyers should go for a 15in or 17in monitor capable of running a resolution of 1024 by 768, non-interlaced, at 70Hz or higher. Be aware that the visible area of most monitors (and TVs for that matter) is smaller than the model implies: a 15in may only have 14.5in, and a 17in only 16in.

Recommended Products: Monitors
Sony 15sfll or NEC XV15 Plus costing around £300 on the street, or the larger **Sony 17sfll and NEC XV17** at around £550.

Buying a
GRAPHICS CARD ▶

The graphics card sits inside the PC and controls the features that the software can display on the monitor.

Check the amount of memory on the card. 2Mb is about standard these days, 1Mb is skimpy and 512Kb is barely usable. Also, check out the performance
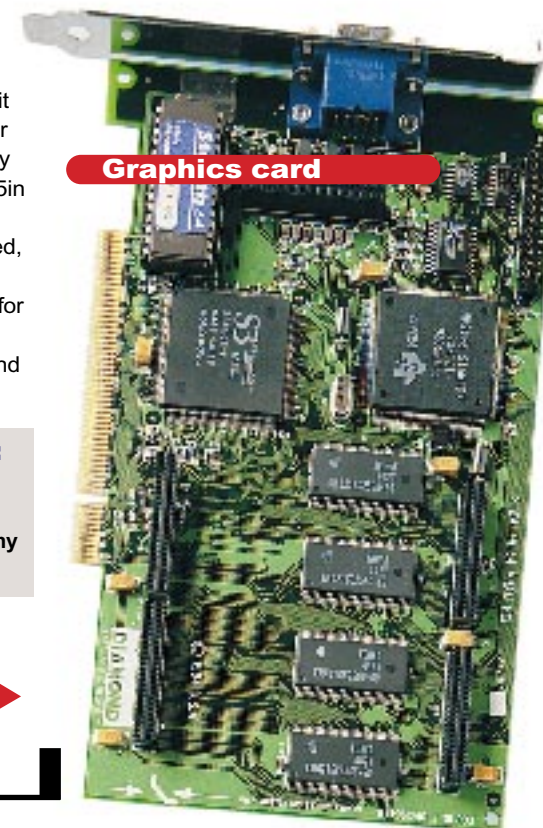
Graphics card

capability of the card. Video cards come as 16-bit, 32-bit, 64-bit and even 128-bit — all you need to know is that a large numbers of bits means faster performance and more colours.

The most important aspect of your video card, and the most frequently quoted feature, relates to the resolution which the card supports in Windows. This is measured in terms of the number of pixels that the card displays on the screen. The absolute minimum these days is 1024 x 768 with a refresh rate of 70Hz. The refresh rate is an important figure to look out for, as it relates to the flicker which you will perceive from your monitor.

Finally, find out whether your video card is "local bus" or not. "Local bus" is a type of interface which connects your video card to the motherboard. It allows the memory in the card to be addressed directly by the CPU which makes it a lot faster than the standard ISA (Industry Standard Architecture) interface.

Recommended Products: Graphics Cards
ATI Video Xpression: ATI Technologies 01235 833666; around £175 (Graphics card group test p150)
Diamond Stealth 64 VRAM: Diamond 01753 501400; from around £190
VideoLogic GrafixStar 400: VideoLogic 01923 260511 from about £115
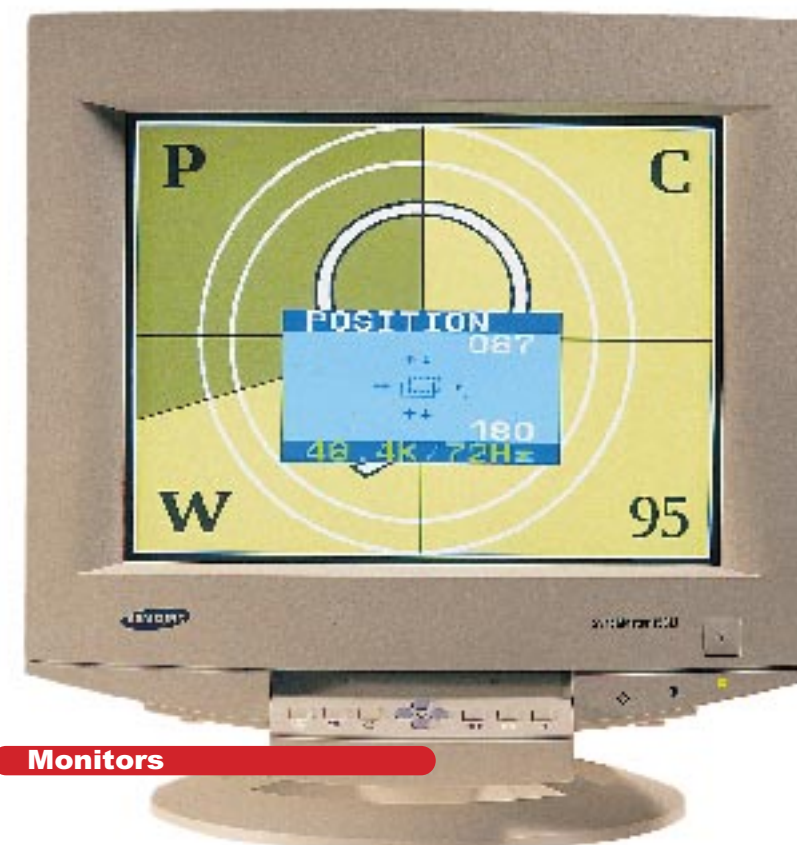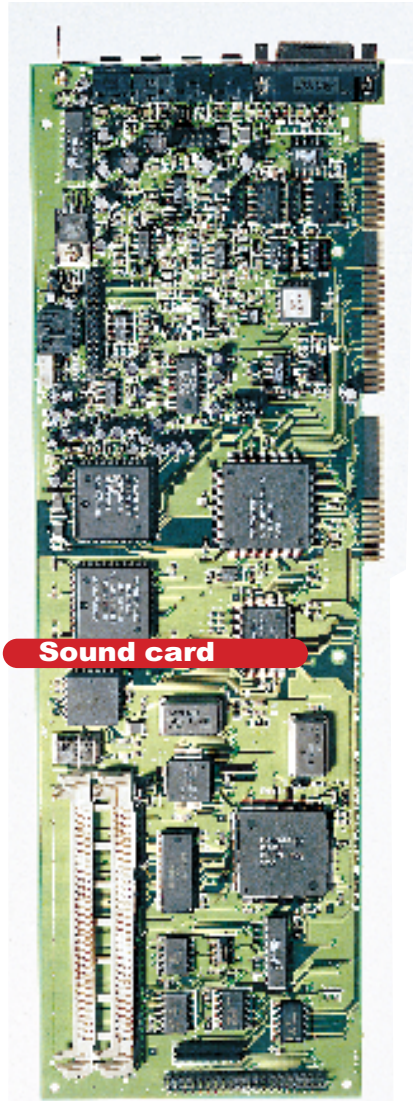
Sound card

Buying a SOUND CARD

As their name suggests, they add sound capability to a PC. Check compatibility with your CD-ROM drive, and remember that 16-bit cards capable of 44kHz provide higher-quality sound than slower 8-bit cards. Better sound cards now include wavetable synthesis which means they have samples of real instruments held in ROM.

The quality of wavetable synthesis still varies widely. Even cheap cards which have the inferior Frequency Modulation synthesis should have a daughterboard connector allowing them to be upgraded to wavetable. The newer cards are also plug'n'play which means, in theory, that you should be able to plug them straight into a PC without any extra configuration. Most cards are bundled with extra software, normally sequencers, wave editors and audio players.

Recommended Products: Sound Cards

Creative Labs AWE-32: 01245 265265; £199 (PCW April 96)
Budget: Aztech SoundGalaxy Waverider Pro: Aztech 01734 814121; £79 (PCW April 96)

Buying SOFTWARE

Just a few years ago there were dozens of different software applications in each category. In the last two years or so, however, there's been rapid product consolidation. Other magazines list large numbers of packages, most of which are out of date and aren't worth considering. We've distilled each category down to just one or two recommended products.

Software A-Z

A
● **ACCOUNTS SOFTWARE** One of the few categories in which there are still masses of packages on the market at a huge range of different prices. Accounts is also one of the last bastions of DOS.
Recommended products: Lakeview LMS and Exchequor from SBS Systems.

C
● **CAD SOFTWARE** Computer Aided Design covers everything from architectural drawings through office planning to complex engineering drawings.
Recommended products: AutoCAD, now at release 13, is still the industry standard. However, it's expensive and complex. For the casual user, Drafix QuickCAD is a cheap and accessible way to try your hand at it.

● **CONTACT MANAGERS** (see PIMs)

D
● **DATABASE** At its simplest, an electronic card index. For just a few hundred names and addresses, an electronic filofax such as Lotus's Organizer may be more appropriate. But for more sophisticated applications like tracking products and customers, the power of a relational database is required. Databases are generally the least user-friendly of the main suite applications. In most office environments you're more likely to use a database application that somebody else has written for you.
Recommended products: Lotus Approach, Microsoft Access
● **DRAWING SOFTWARE** Programs for drawing that work using vectors. This means each shape drawn is described using mathematical equations.
Recommended products: At the budget end, GSP Designworks 3 stands out. At the professional end of things it's FreeHand 5 which gets our plaudits.

I
● **IMAGE EDITING SOFTWARE** A program for editing bitmap files (files made up of pixels). Typically used for converting graphics files, retouching photographs and preparing pictures for printing.
Recommended product: For simple image editing the popular shareware program Paintshop Pro is fine. For professionals, Adobe's Photoshop is the industry standard.
● **INTEGRATED PACKAGES** Typically these combine the functionality of a database, word processor and spreadsheet in one application. This makes it easy to move data from one component to another, but integrated packages tend to lack some of the advanced features of individual applications in the Suites.
Recommended product: Microsoft Works
● **OCR SOFTWARE** Optical Character Recognition software converts printed text into computer text you can edit. You will also need a scanner or fax card to get the printed text on to your PC. OCR saves re-keying documents and can cut down drastically on paper filing systems.
Recommended products: Omnipage is the best product we've found, but TextBridge offers most of the same capabilities for less cash.
● **PERSONAL FINANCE** These help you manage home finances. They're also well suited to some small businesses and tend to be easier to use than full-blown accounts packages.
Recommended products: Quicken is the outstanding product in this category and has no serious rivals.
● **REMOTE CONTROL SOFTWARE** Software which lets you access and control a PC remotely usually using a modem.
Recommended products: Reachout, for its simple interface and support for different networks, particularly TCP/IP.
● **SPREADSHEET** An electronic version of an old-fashioned ledger. Ideally suited for balance sheets and sales figures. They now include excellent graphing and charting facilities.
Recommended products: Lotus 1-2-3, Microsoft Excel

S
● **SUITES** These days, most general business software (word processors, spreadsheets, presentation graphics packages) is sold in Suites. Two suites are widely available: Lotus SmartSuite and Microsoft Office. If you buy them bundled with a new PC, they can cost £100 or less. Bought separately, they cost between £200 and £300. Lotus SmartSuite also contains a database. For Microsoft Office you pay extra for Office Professional which contains Microsoft's Access database.
Recommended products: Microsoft Office is now close to the industry standard. Its high level of integration gives it the edge over the opposition.

P
● **PERSONAL INFORMATION MANAGERS (PIMs)** PIMs are an electronic way of storing names, addresses, phone numbers and appointments. Contact managers take the idea one step further to include business information about dealings with clients.
Recommended products: Sidekick 95 and Organizer are excellent PIMs. For contact managers we recommend Goldmine for Windows.
● **PRESENTATION GRAPHICS** Increasingly the trend is towards doing presentations on a PC and the latest packages tackle this by including sound, sophisticated transitions between slides and support for video clips.
Recommended products: Powerpoint and FreeHand are both capable products that are sold with Microsoft Office and SmartSuite respectively.
● **PROGRAMMING TOOLS** Applications designed for writing software. These range from "low-level" languages which are powerful but difficult to learn and use, to "high-level" languages which are much easier to use but generally sacrifice performance and flexibility in the process.
Recommended products: Delphi 2.0 is a great example of scalability, catering for beginners *and* serious developers working on major projects. Visual C++ is the pick of the high-end Windows development tools.

V
VISUAL PROGRAMMING (see Programming Tools)

W
WORD PROCESSOR An application in which you write letters and reports or even produce a simple newsletter. The latest word processors have advanced features such as outliners, table editors and facilities for adding up columns of figures.
Recommended products: Microsoft Word is the clear market leader. WordPro (formerly AmiPro) is a capable alternative.

A-Z of Recommended Software Products

	Category	Product	Supplier	Contact	Price	Date of PCW review
A	Accounts	Lakeview LM3	Lakeview Computers	0181 303 3329	£8,750	Jan-96
	Accounts	Exchequor	SBS Financial Systems	01202 298008	£5,980	Jan-96
C	CAD	AutoCad Release 13	Autodesk UK	01483 303 322	£3,150	Oct-95
	CAD	Drafix Quick CAD	Roderick Manhattan	0181 875 4400	£69	Oct-95
D	Database	Approach	Lotus	01784 455 445	£99	Nov-95
	Database	Access	Microsoft	01734 270 001	£220	Feb-96
	Drawing	Freehand 5	MacroMedia	01344 761111	£450	Apr-96
	Drawing	Designworks 3	GSP	01480 496789	£39.95	Apr-96
I	Image Editing	Photoshop	Adobe	0181 606 4000	£382	Apr-95
	Image Editing	Paintshop Pro	Digital Workshop	01295 258335	£49.95	Jun-95
	Integrated Package	Works	Microsoft	01734 270 001	£79.99	Oct-95
O	OCR	Omnipage	Caere	0171 630 5586	£595	Nov-95
	OCR	Textbridge	Xerox Imaging Systems	01734 668 421	£349	Nov-95
P	Personal Finance	Quicken	Intuit	0800 585058	£49.95	May-96
	PIM/contact manager	Organizer 2.1	Lotus	01784 455 445	£99	Mar-96
	PIM/contact manager	Goldmine for Windows	Elan Software	0171 454 1790	£395	Mar-96
	PIM/contact manager	Sidekick 95	Starfish UK	0181 875 4400	£39	Mar-96
	Presentation graphics	Freelance	Lotus	01784 455 445	£415	Sep-94
	Presentation graphics	Powerpoint	Microsoft	01734 270 001	£220	Sep-94
	Programming tools	Visual C++	Microsoft	01734 270 001	£379	Feb-96
	Programming tools	Delphi 2.0	Borland	01734 320 022	249	Feb-96
R	Remote Control	Reachout	Stac Electronics	01483 740 763	£110	Nov-95
S	Spreadsheet	Excel	Microsoft	01734 270 001	£220	May-95
	Spreadsheet	1-2-3	Lotus	01784 455 445	£365	May-95
	Suite	Office (Standard)	Microsoft	01734 270 001	£360	Mar-96
	Suite	Office (Professional)	Microsoft	01734 270 001	£460	Mar-96
W	Word Processing	Word	Microsoft	01734 270 001	£220.00	Feb-95
	Word Processing	WordPro (AmiPro)	Lotus	01784 455 445	£99.00	Jun-95

Buyer's Charter

MAIL ORDER PROTECTION SCHEME

Hello, I'm Anthony George, your Customer Services Manager. My job is to assist you when things go wrong or when you have a complaint about advertisements in *Personal Computer World*. If you encounter a problem, write to me with details of the complaint and I will contact you.

Ten rules to buy safely

1. Always use a PERSONAL COMPUTER WORLD order form.
2. Keep a copy of the original advert.
3. Keep copies of all correspondence, and if you speak on the phone make a note of who you spoke to.

4. On large orders obtain a written quotation.
5. Wherever possible pay with a personal credit card. All transactions over £100 should be covered by the card company's insurance scheme.
6. Does the price quoted include everything discussed? Is VAT extra?
7. Check how they will deliver and if times are guaranteed.
8. Is telephone support or on-site maintenance included in the price? If a return to base warranty can be extended, how much does it cost?
9. Check that all branded components are genuine.
10. Is the supplier reputable? Do they comply with BS5750 or ISO900? If in doubt, ask to see customer testimonials.

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1. Not received the goods for which you have paid or had your money returned.
2. Followed all our guidelines when placing your order.
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4. Submitted a detailed claim in writing to the magazine's customer services manager not earlier than 28 days and not later than three months from the official on-sale date of the magazine from which the goods were ordered. For example, by the end of June for the May issue (which is on sale at the beginning of April).

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3. The "Buyer's Charter" will not safeguard any commercially orientated outlet, neither will it cover goods which are purchased outside Great Britain or any goods which are obtained for resale.

ORDER FORM

Personal Computer World

ALWAYS KEEP A COPY !

Use this form when you order by phone, fax or post.

ORDER FORM

SUPPLIER'S DETAILS

COMPANY ....

SALESPERSON'S NAME ....

ADDRESS ....

....

....

.... POSTCODE ....

DATE OF TELEPHONE ORDER .... / .... / .... TIME ....

ORDER REFERENCE NUMBER (IF QUOTED) ....

DISPATCH REFERENCE NUMBER ....

CUSTOMER DETAILS

NAME ....

COMPANY ....

ADDRESS ....

....

....

.... POSTCODE ....

DATE OF TELEPHONE ORDER .... / .... / ....

ORDERED BY: ☐ TELEPHONE ☐ FAX ☐ POST

ADVERT APPEARED IN PCW:

ISSUE DATE .... PAGE ....

QUANTITY	DETAILS OF ORDER	UNIT COST £	TOTAL £

METHOD OF PAYMENT

☐ PERSONAL CHEQUE ☐ PURCHASE ORDER ☐ CREDIT CARD
☐ C.O.D ☐ CHARGE CARD ☐ OTHER (SPECIFY) ....

CREDIT CARD COMPANY .... START DATE .... / .... / ....

CHARGE CARD COMPANY .... START DATE .... / .... / ....

CARD NUMBER (below) EXPIRY DATE .... / .... / ....

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐

SUB TOTAL _____

DISCOUNT _____

CARRIAGE _____

SURCHARGES _____

VAT _____

TOTAL _____

DELIVERY DETAILS

DELIVERED TO (ADDRESS)
(IF DIFFERENT FROM ABOVE) ....

....

.... POSTCODE ....

AGREED DELIVERY DATE .... / .... / ....

☐ TERMS OF WARRANTY ☐ MONEY BACK
☐ RETURNS POLICY ☐ COST OF EXTENDED WARRANTY
☐ HELPLINE

Details: ....

....

SIGNED .... DATE .... / .... / .... DAYTIME TELEPHONE NUMBER ....

ChipChat

You know you are a computer programmer…

● When your ideal evening consists of fast-forwarding through the latest sci-fi movie looking for technical inaccuracies.

● When you have modified your can-opener to be microprocessor driven.

● When you can name six Star Trek episodes and own "Official Star Trek" anything.

● When you are convinced you can build a phaser out of your garage door opener and your camera's flash attachment.

● When your wristwatch has more buttons than a telephone and more computing power than a 486DX-50.

● When you have used coat hangers and duct tape for something other than hanging coats and taping ducts.

● When you think that when people around you yawn, it's because they didn't get enough sleep.

● When you have a habit of destroying things in order to see how they work.

● If you have ever taken the back off your TV just to see what's inside.

● If you thought the concoction ET used to phone home was stupid as you believe the aliens who live among us are far more intelligent.

● If you ever burned down the school sports hall with your Science Fair project.

● If you can type at 70 words per minute but can't read your own handwriting.

Oops!

Apologies to those expecting to see the *PCW* Awards in this issue — the winners will be announced next month.

● In the Lexmark Colour Jetprinter 1020 *vs* Epson Stylus Color II review (*First Impressions,* April) we stated that Lexmark provides printer cables with the printer. Lexmark has confirmed that this is not the case (except for press review models) and that buyers must purchase their own. We regret any confusion caused by this error.

● VideoLogic's phone number was wrong in the April issue (3D Accelerators). The correct phone number is 01923 260511.

● Scandisk actually appeared in DOS version 6.2, not version 6.0 as mentioned in the *Beginners* column last month.

Where are they now?

PCW's intrepid reporters have discovered the whereabouts of old time heavy metal rocker Ozzie Osborne. No longer strumming the guitar and biting the heads off chickens in front of thousands of screaming fans, it appears our Ozzie is now working for IBM.

Ozzie was on the road again recently, this time lunching with lowly UK IT journalists in his new capacity as worldwide vice president, systems strategy, IBM PC Company, head of relationships — Intel and Microsoft. Word on the street was that he would give a "valuable and stimulating lunch briefing" — PR speak for a rockin' good time, but please hold the chicken. It just goes to show you that old rockers never die — they just go to IBM.

WE NEED TO UPGRADE THE RAM…
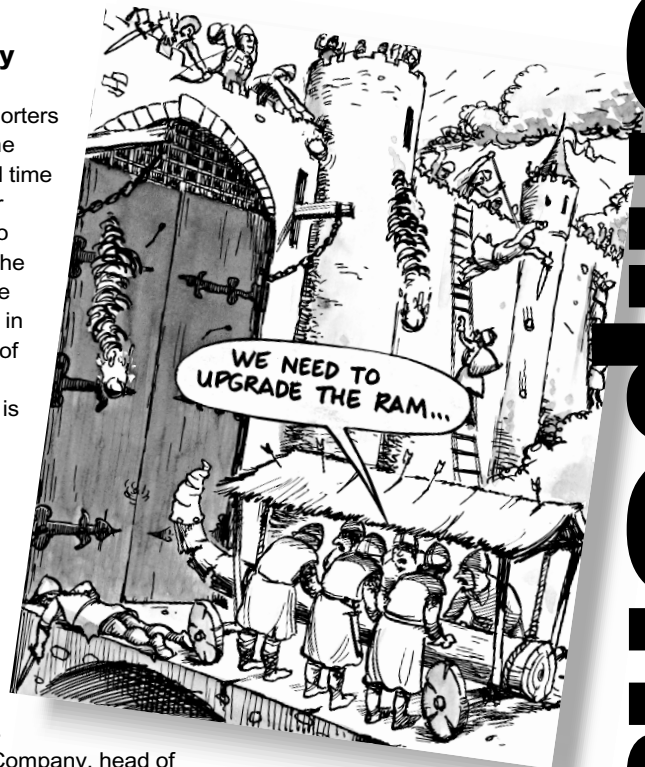
3M Company and POST-IT

We included the Postit shareware utility on our April 1996 CD. "POST-IT" is a trademark of 3M Company which manufactures a large range of POST-IT™ products in a wide variety of formats and colours. This year in the USA 3M has launched POST-IT software notes for the PC which is due to be launched in Europe later this year. We acknowledge that the POST-IT brand is the property of 3M and use of the mark POST-IT was not authorised by 3M and was inadvertent.

Personal Computer World personal number plate

You too can be the proud owner of a personalised number plate from your favourite magazine. *PCW* has been told that a company specialising in registration plates has just received B7 PCW and B8 PCW. Each plate is being sold at £520 (+VAT, plus the standard DoT £80 fee). A special discount will be given to anyone offering to buy both. We've informed our publisher about the deal but haven't heard whether he's interested in the "his 'n hers" combo. Anyone else attracted by the offer should phone High Profile on 01494 432282 to place their bid.